Operation/Reference Guide

TPI-PRO

Total Presentation Interface - Pro Edition

TPI-PRO-4
TPI-PRO-2



Touch Panel Interface

Last Revised: 11/12/2008

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Overview

The *TPI-PRO Total Presentation Interface - Pro Edition* serves as a video switcher that allows users to incorporate large-scale touch-screen technology from a variety of manufacturers into an AMX NetLinx controlled system.

With the TPI-PRO, multiple video and RGB sources can be simultaneously delivered to a display, then controlled and managed via a connected touch monitor or through send commands on the NetLinx Controller. The combined image can be output in real time to video displays and projectors.

The TPI-PRO receives control and touch point information from a variety of pointing devices (i.e. touch screen, mouse, or keyboard), and connects to the control system via Ethernet.

The TPI-PRO is available in two versions:

- The TPI-PRO-4 (FG2275-104) supports up to four inputs.



FIG. 1 TPI-PRO-4

- The TPI-PRO-2 (FG2275-102) supports up to two inputs.



FIG. 2 TPI-PRO-2

Both TPI-PROs support high resolution inputs/outputs:

- **Inputs (2 or 4)**: Composite, VGA (up to 1920x1200), Component (up to 1080p). Inputs can be scaled to fit into independent windows or viewed full-screen.
- **Outputs (2)**: VGA up to 1920x1200 (WUXGA) 60 Hz.

Basic features of both include:

- Up to 4 video or RGB windows can be simultaneously displayed and controlled
- USB (wired and wireless) mouse pass-through allows the presenter to view and control up to four computers from one display

TPI-PRO-4 Front and Rear Components

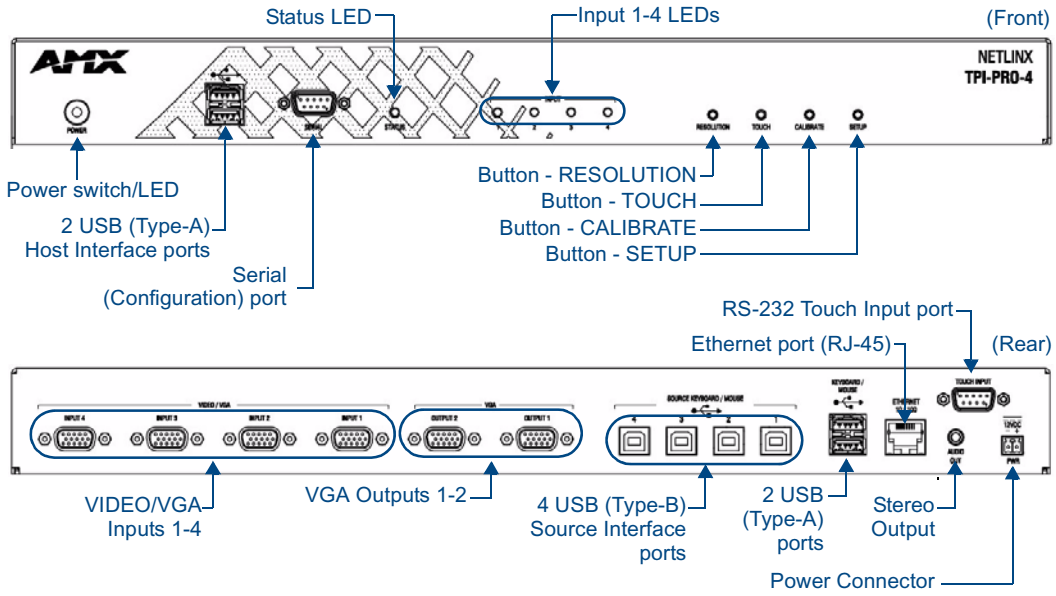


FIG. 3 TPI-PRO-4

TPI-PRO-2 Front and Rear Components

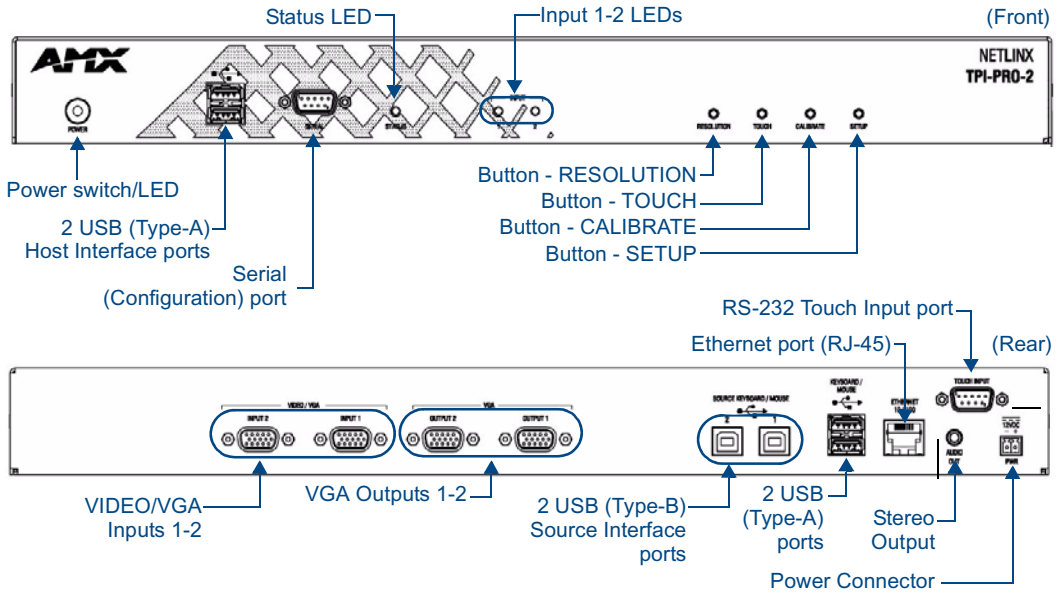


FIG. 4 TPI-PRO-2

TPI-PRO Specifications

The following table lists the specifications for the TPI-PRO-4 and TPI-PRO-2. Note that the primary difference between the TPI-PRO-4 and TPI-PRO-2 is in the number of inputs. In terms of functionality and specifications, they are otherwise identical. Therefore, the specifications listed below apply to both versions, unless specifically noted.

TPI-PRO Specifications	
Power Requirements:	• Constant current draw: 2.6 A @ 12 VDC • The PSN6.5 Power Supply (FG423-40 - not included) is recommended, to accommodate all possible configurations and respective power draws.
Memory:	• 256 MB SDRAM • 256 MB disk memory • See the *Other AMX Equipment:* section on page 6 for component upgrade information.
Supported Video Resolutions:	Input Composite Video and S-Video: • NTSC M/J • NTSC 4.43 • PAL B/D/I/G/H • PAL 60 • PAL M • PAL N • PAL Nc • SECAM B/D/G/K/L Input Component Video: • NTSC 480i, 480p • PAL 576i, 576p, 720p, 1080i, 1080p
Supported Audio Sample Rates:	48000Hz, 44100Hz, 32000Hz, 24000Hz, 22050Hz, 16000Hz, 12000Hz, 11025Hz, and 8000Hz.
Front Panel Components:	
Power switch/LED	Toggles the unit off and on. • Light Off: Power to the unit is either not plugged in, below approximately 10VDC, above approximately 19VDC, or cross-wired. • Constant Green: Power to the unit is within nominal voltage limits (between 10VDC and 19VDC, approximately), the unit is on, and all internal power supplies are operating normally. • Constant Yellow: Power to the unit is within nominal voltage limits (between 10VDC and 19VDC, approximately) and the unit has been turned off by pressing the power switch for more than two seconds. • Flashing Yellow: Power to the unit is within nominal voltage limits (between 10VDC and 19VDC, approximately), but one or more of the internal power supplies are not operating correctly. The unit needs to be serviced. Contact AMX Technical Support for further instructions.
USB Type-A Host ports	2 USB ports that can be used for a keyboard, mouse, external storage unit, or USB-capable touch panel interface. • USB 2.0 support is required for all USB devices. • Do not use a USB hub to connect multiple USB devices to the TPI-PRO.
Serial (Programming) port	DB9 connector (male) connects to a DB9 serial port on a PC, for serial communication.
Status LED	• Constant ON: No communication with the NetLinx Master • Blinking: In communication with the NetLinx Master

TPI-PRO Specifications (Cont.)	
Input LEDs	Yellow LEDs indicate a valid input signal on each source input (1-4 on the TPI-PRO-4, 1-2 on the TPI-PRO-2).
Buttons	Four white buttons provide access to the following configuration options: • RESOLUTION: Opens a screen used to select the TPI-PRO output video signal resolution, ranging from 640 x 480@60Hz to 1920 x 1200@60Hz. *This output resolution cannot be greater than the resolution on the connected panel.* Refer to the *Setting the Output Resolution on the TPI-PRO* section on page 26 for more information. • TOUCH: Opens the *Protected Setup* page, where you can select (from a series of touch panel drivers), and select the driver that corresponds to the touch panel connected to the TPI-PRO (via the TOUCH INPUT connector. Refer to the *Setting the Touch Drivers* section on page 27 for more information. • CALIBRATE: Opens the *Calibration* page, displaying a series of crosshairs. These crosshairs are used to calibrate the touch device being used. Refer to the *Calibrating the TPI-PRO Using a USB Input* section on page 28 for more information. • SETUP: Opens the TPI-PRO firmware setup menu. Refer to the *Firmware Pages and Descriptions* section on page 47 for more information.
Rear Panel Components:	
VIDEO/VGA Inputs	HD-15 connectors, one per input source (1-4 on the TPI-PRO-4, 1-2 on the TPI-PRO-2). Each connector supports VGA graphics, S-video, composite video, and component video.
VGA Outputs	2 HD-15 connectors: • 1 connector for the touch-panel control display which displays the video feeds, G4 graphics, external windowed video/graphics inputs, and annotation graphics (G4 graphics can be turned off under program control). • 1 connector for the public-view non-touch monitor which displays only the video feeds, G4 graphics, external windowed video/graphics inputs, and annotation graphics (G4 graphics can be turned off under program control). Each output can send a maximum resolution of 1920 x 1200@60 Hz. ***Note:*** *Both output uses the same resolution settings.*
Source TOUCH, KEYBOARD/MOUSE USB ports	2 or 4 USB Type-B device ports, one per source computer—for source USB Touch Monitor, mouse/keyboard control (1-4 on the TPI-PRO-4, 1-2 on the TPI-PRO-2). • USB 2.0 support is required for all USB devices. • Do not use a USB hub to connect multiple USB devices to the TPI-PRO.
Host USB Touch Monitor KEYBOARD/MOUSE USB ports	2 USB Type-A ports that can be used for a keyboard, mouse, external storage unit, or USB-capable touch panel interface. • USB 2.0 support is required for all USB devices. • Do not use a USB hub to connect multiple USB devices to the TPI-PRO.
ETHERNET 10/100 port	RJ-45 port provides 10/100 Mbps communication communicates with the NetLinx Master (via ICSP protocol over Ethernet). • The Ethernet port automatically negotiates the connection speed (10 Mbps or 100 Mbps), and whether to use half duplex or full duplex mode. • This communication is reflected via the front ICSP LED.
TOUCH INPUT port	RS-232 (DB9) 9-pin serial port provides connectivity to a pointer device (i.e. touch screen) that requires a serial connection.
AUDIO OUT connector	3.5mm mini-jack provides stereo output - for use with line-level (0.707 VRMS) non-amplified stereo output only.
Power connector	2-pin 3.5 mm mini-Phoenix connector.

TPI-PRO Specifications (Cont.)	
Serial Touch Drivers:	For an updated list of available serial touch input drivers that are selectable by using the TOUCH button on the front panel of the TPI-PRO, visit **www.amx.com**. Refer to the *List of Available Pixel Display and Refresh Rates* section on page 140 for a more detailed list of Touch Monitors that have been tested with the TPI-Pro.
USB Drivers:	USB Touch drivers are automatically loaded when the USB Touch Monitor is detected. Refer to **www.amx.com** for latest list of supported USB touch drivers.
Button Assignments:	Button assignments can be modified in TPD4 (not on the TPI-PROs.) • Button channel range: 1 - 4000 button push and feedback (per address port) • Button variable text range: 1 - 4000 (per address port) • Button states range: 1 - 256 (General Button; 1 = Off State, 2 = On State) • Level range: 1 - 600 (Default level value 0-255, can be set up to 1-65535) • Address port range: 1 - 100
Communication/ Programming:	Master communication and programming is available via an Ethernet connection. Refer to the *Step 3: Configuring the Ethernet Connection Type* section on page 34 for more information. There are several methods of TPI-PRO communication and programming available: • DHCP - Refer to the *IP Settings section - Configuring a DHCP Address over Ethernet* section on page 33 for more information. • Static IP - Refer to the *IP Settings section - Configuring a Static IP Address over Ethernet* section on page 33 for more information. • URL - Refer to the *Master Connection section - NetLinx Master Ethernet IP Address - URL Mode* section on page 35 for more information. • Listen - Refer to the *Master Connection section - NetLinx Master Ethernet IP Address - Listen Mode* section on page 36 for more information. • Auto - Refer to the *Master Connection section - NetLinx Master Ethernet IP Address - Auto Mode* section on page 37 for more information. • NPD (UPD - Refer to the *Master Connection section - NetLinx Master Ethernet IP Address - NDP (UDP) Mode* section on page 37 for more information. • URL (UPD) - Refer to the *Master Connection section - NetLinx Master Ethernet IP Address - URL (UDP) Mode* section on page 38 for more information.
Enclosure:	Metal with black matte finish
Operating/Storage Environment:	• Operating Temperature: 0° C (32° F) to 40° C (104° F) • Operating Humidity: 5% to 85% RH Non-Condensing • Storage Temperature: -10° C (14° F) to 70° C (158° F) • Storage Humidity: 0% to 85% RH Non-Condensing
Dimensions (HWD):	• 2.24" x 17.00" x 10.27" • 5.69 cm x 43.18 cm x 26.09 cm
Weight:	8.25 lbs (3.74 kg)
Certifications:	• FCC (Class B) • CE • IEC60950
Included Accessories:	• 2-pin PWR connector (41-5025) • Assembly Kit (Four-#10-32 screws and Four-#10 washers) (KA0001) • Rack Ear brackets for shelf, wall, and under-table mounting (60-0900-03) • TPI-PRO Quick Start Guide (93-2275-101) • NXA-USBTN, TakeNote USB Computer Control Stick (FG070-603)

TPI-PRO Specifications (Cont.)	
Other AMX Equipment:	• PSN6.5: Power Supply with 3.5 mm mini-Phoenix connector (**FG423-40**) • CC-HD15M-HD15M – HD-15 Male to HD-15 Male, 6’ cable (**FG10-2170-01**) • CC-HD15M-RCAM3 – HD-15 to 3x Male RCA connectors for component or composite sources (**FG10-2170-03**) • CC-HD15M-SVIDM – HD-15 Male to S-Video Male connector, 6’ cable (**FG10-2170-04**)

Installation

Overview

The TPI-PRO comes included with rack ears that can be rotated 90° in any direction to accommodate several different mounting options, including tabletop, under/over the table, and vertical wall mounting. Rotate the mounting brackets to mount the TPI-PRO on top of a flat surface, under-table, or vertically.

Mounting the TPI-PRO into an 19" Equipment Rack

The TPI-PRO occupies one rack unit in a standard 19" equipment rack. The included mounting brackets can be rotated 90° in any direction to accommodate several different mounting options, including tabletop, under/over the table, and vertical wall mounting.

The following steps apply to all of these mounting options.

1. Discharge any static electricity from your body by touching a grounded metal object.
2. Position and install the mounting brackets, as shown in FIG. 5, using the supplied mounting screws. The mounting brackets can be rotated to accommodate your mounting needs.

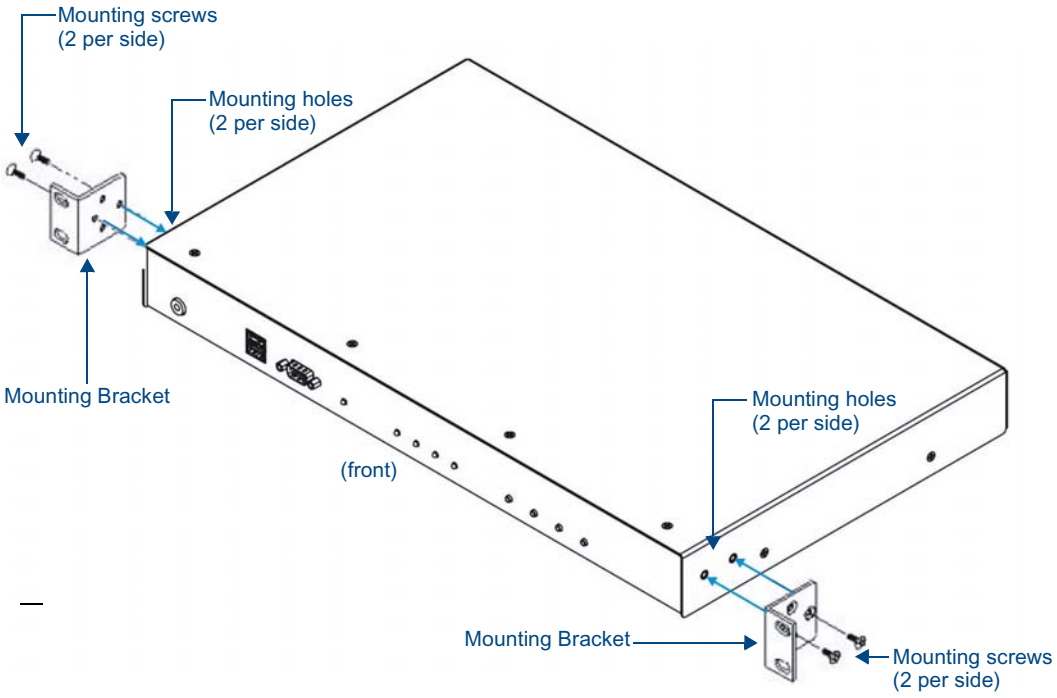


FIG. 5 Rack-Mounting the TPI-PRO

3. Connect any applicable wires to the TPI-PRO. Refer to the *Wiring and Device Connections* section on page 11 for wiring diagrams and pinout descriptions.

 Connect the unit only to a properly-rated supply circuit.

WARNING

DO NOT stand other units directly on top of the TPI-PRO when it is rack mounted, as this will place excessive strain on the mounting brackets.

Ventilation

ALWAYS ensure that the rack enclosure is adequately ventilated.



The maximum operating ambient temperature is 40°C.

Sufficient airflow must be achieved (by convection or forced-air cooling) to satisfy the ventilation requirements of all the items of equipment installed within the rack.

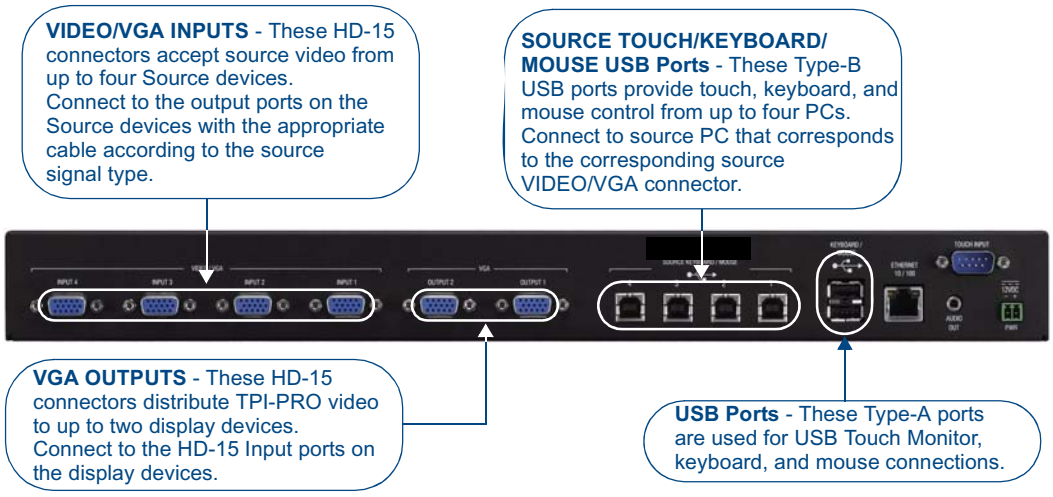


Never restrict the airflow through the device's fan or vents.
When installing equipment into a rack, distribute the units evenly. Otherwise, hazardous conditions may be created by an uneven weight distribution.
Reliable earthing (grounding) of rack-mounted equipment should be maintained.

Wiring and Device Connections

Overview

Most device connections are made via the ports on the rear panel of the TPI-PRO (FIG. 6).

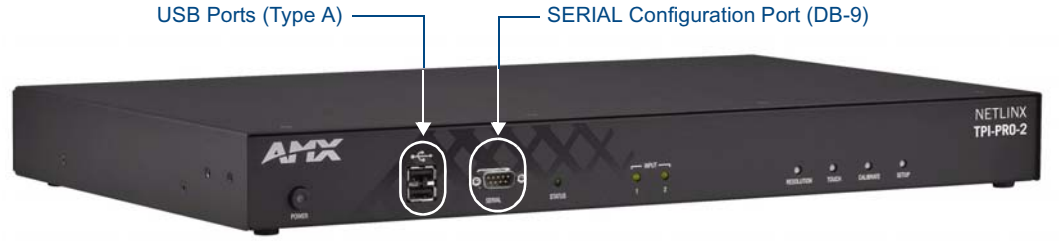


Note that the rear panel connectors on both versions of the TPI-PRO are identical, with the exception of the number of HD-15 inputs for VIDEO/VGA (four on the TPI-PRO-4, two on the TPI-PRO-2), and SOURCE KEYBOARD/MOUSE USB ports (four on the TPI-PRO-4, two on the TPI-PRO-2).

FIG. 6 TPI-PRO-4 - rear panel connectors

For detailed descriptions of the rear panel connectors, refer to the *Connector Details and Pinout Configurations* section on page 17.

The only connectors on the front panel are two USB (Type A) ports, which allow the TPI-PRO to connect an input device like a USB touch monitor, mouse, or keyboard, and a RS-232 SERIAL (Configuration) port (FIG. 7).



Note that the front panel connectors on both versions of the TPI-PRO are identical.

FIG. 7 TPI-PRO-4 - front panel connectors

See the *Programming* section on page 75 for a detailed description of the front panel RS-232 SERIAL port and a listing of supported NetLinx Send_Commands

System Diagrams

The following System Diagrams illustrate the most common applications for the TPI-PRO. For detailed pinout descriptions for each connector on the TPI-PRO, refer to the *Connector Details and Pinout Configurations* section on page 17.

Example 1 (TOUCH INPUT)

The example below displays a typical installation using a touch panel to display output from a video source (in this case, a PC.)

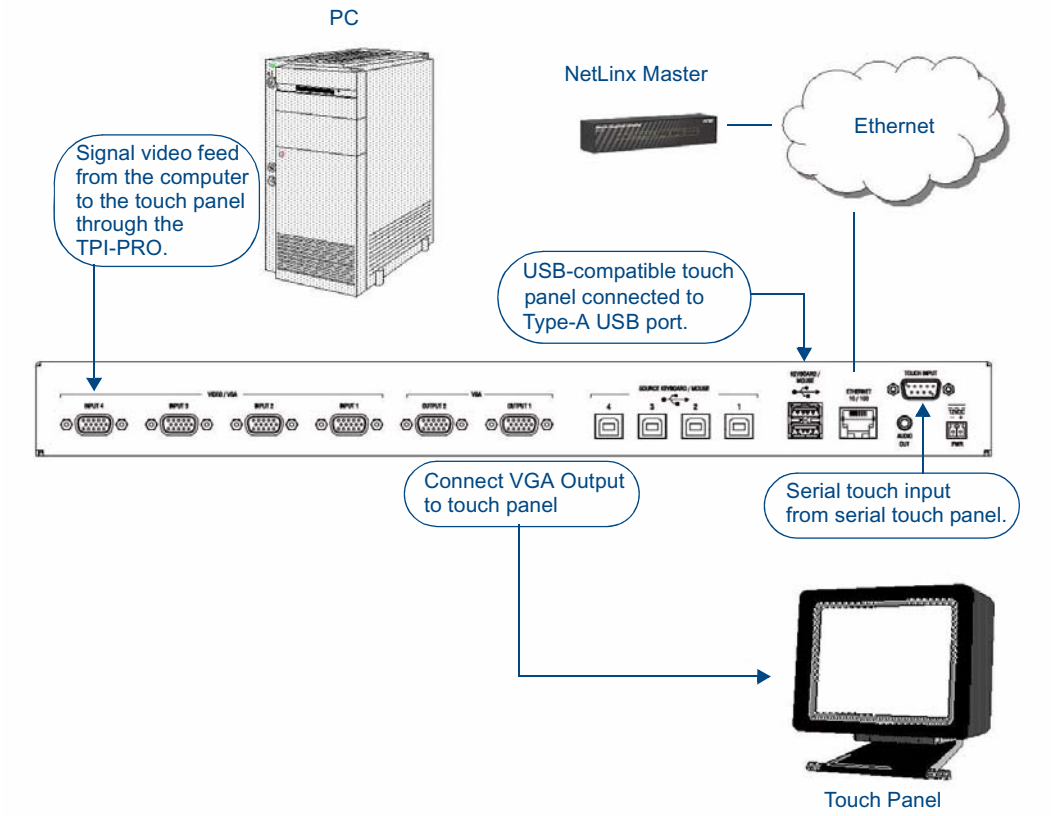


FIG. 8 System Installation Example 1 (TOUCH INPUT)

Follow these steps to configure the TPI-PRO for touch panel input:

1. Discharge any acquired static electricity by touching a grounded metal object.
2. Disconnect any incoming power connector from the rear of the TPI-PRO.
3. If connecting a serial touch monitor, attach the DB9 touch panel cable (male) to the 9-pin TOUCH INPUT connector (male) on the rear of the TPI-PRO. Refer to the *TOUCH INPUT (DB9) Port* section on page 21 for a description of the TOUCH INPUT connector pinouts. If connecting a USB touch monitor, attach the cable to the USB Type A port. Touch panels can connect to either the TOUCH INPUT connector or one of the Type-A USB ports, depending on the compatibility of the touch panel.
4. Connect the touch panel's HD-15 video cable to one of the VGA OUTPUT port on the rear of the TPI-PRO.
5. Connect an HD-15 cable from the rear video port (on the computer) to one of the VGA/RGB 15-pin male HD-15 input connectors on the rear of the TPI-PRO unit.

6. Cycle power the unit. Cycle powering the unit allows it to detect the new configuration.

Example 2 (Mouse Pass-Thru Control)

The example below displays a typical installation for using a touch panel for mouse pass-thru control.

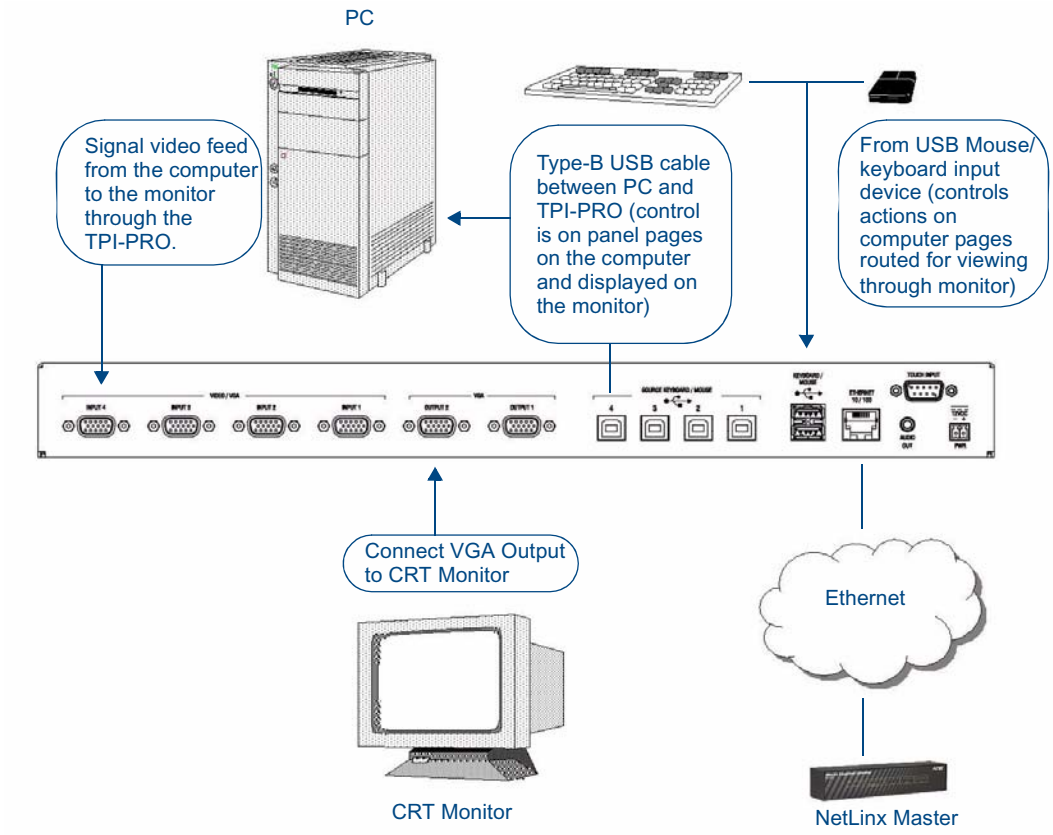


FIG. 9 System Installation Example 2 (Mouse Pass-Thru Control)

To enable a touch response on a panel page routed through a computer, you must enable pass-thru control. Pass-thru control enables the TPI-PRO to act as a control bridge between a computer and a monitor (***typically with no touch features, such as a CRT computer monitor.***)

NOTE

If you experience problems introducing new devices, you can install the drivers on a remote PC according to manufacturer suggestions with the device connected directly to the remote PC.

The two USB connectors on the rear of the TPI-PRO are used to provide signals from a keyboard and/or mouse. The Type-B USB connection on the TPI-PRO is used for communication between the TPI-PRO and the computer.

NOTE

Using a USB hub may cause functionality issues with all USB ports on the TPI-PRO. AMX recommends you do not use a USB hub to connect multiple USB devices to the TPI-PRO.
USB 2.0 support is required for all USB devices.
Removing and reconnecting USB devices from the TPI-PRO front panel may result in a loss of connectivity. If this occurs, resetting the unit will allow the devices to re-establish connectivity.
When disconnecting a USB device, please wait 5-10 seconds before reconnecting or connecting a new device to allow the TPI-PRO to recognize that the first device is disconnected. If connectivity is lost, reset the TPI-PRO to allow re-establishment of the connection.

NOTE

Pass-thru must be enabled when using control devices that are connected to the USB connectors on the rear of the TPI-PRO unit.

You can control a computer by routing the Mouse control through the TPI-PRO and displaying the results on a CRT or non-touch enabled panel. In this scenario, the TPI-PRO is virtually non-existent as it is akin to connecting the monitor and mouse directly to the rear of the computer.

The computer views the TPI-PRO as an adapter connected to a USB mouse device (as seen in FIG. 9).

Follow these steps to configure the TPI-PRO for mouse pass-thru control:

1. Discharge any acquired static electricity by touching a grounded metal object.
2. Disconnect any incoming power connector from the rear of the TPI-PRO.
3. Connect a USB mouse to one of the Type-A USB ports on the TPI-PRO unit.
4. Connect a USB cable from a USB connector port (on the computer) to one of the Type-B USB device port input connectors on the rear of the TPI-PRO unit.
5. Connect an HD-15 cable from the rear video port (on the computer) to the VGA/RGB 15-pin male HD-15 input connector on the rear of the TPI-PRO unit that corresponds to the Type-B USB port to which you connected the USB cable in step 4.
6. Connect the monitor's HD-15 video cable to one of the VGA OUTPUT port on the rear of the TPI-PRO.
7. Cycle power the unit. Cycle powering the unit allows it to detect the new configuration.
8. Code a button on the touch panel page to enable the pass-thru feature on a selected source input. Refer to the *^PPS* section on page 120 for the specific command parameters to enable the pass-thru command. Toggling this coded panel button can enable/disable the pass-thru feature.

NOTE

You first must set the TPI-PRO to match the resolution of the computer's video output resolution, and then you must adjust the TPI-PRO to fit the available screen on the CRT monitor. It is possible the image generated from the TPI-PRO could be slightly "off", in which case you should adjust the image using the CRT's on-board video adjustment buttons.

9. Setup the TPI-PRO output resolution using the procedures in the *Setting the Output Resolution on the TPI-PRO* section on page 26.

NOTE

If the TPI-PRO is turned off and then has power re-applied (power cycling), video alignment settings established through the Video and/or RGB pages could be reset unless the adjusted values have been previously saved. Refer to the Video Settings Page section on page 54 *for more information.*

10. Use the CRT's video adjust buttons to align the incoming video signal to fit into the available screen area. Initially positioning the TPI-PRO incoming video can reduce any later adjustments of the video through the RGB Setup page (H-position, V-position, H-size, etc.)

Example 3 (Using a Touch Panel for Mouse / Touch Pass-Thru Control)

The example below displays a typical installation for using a touch panel for mouse and touch pass-thru control.

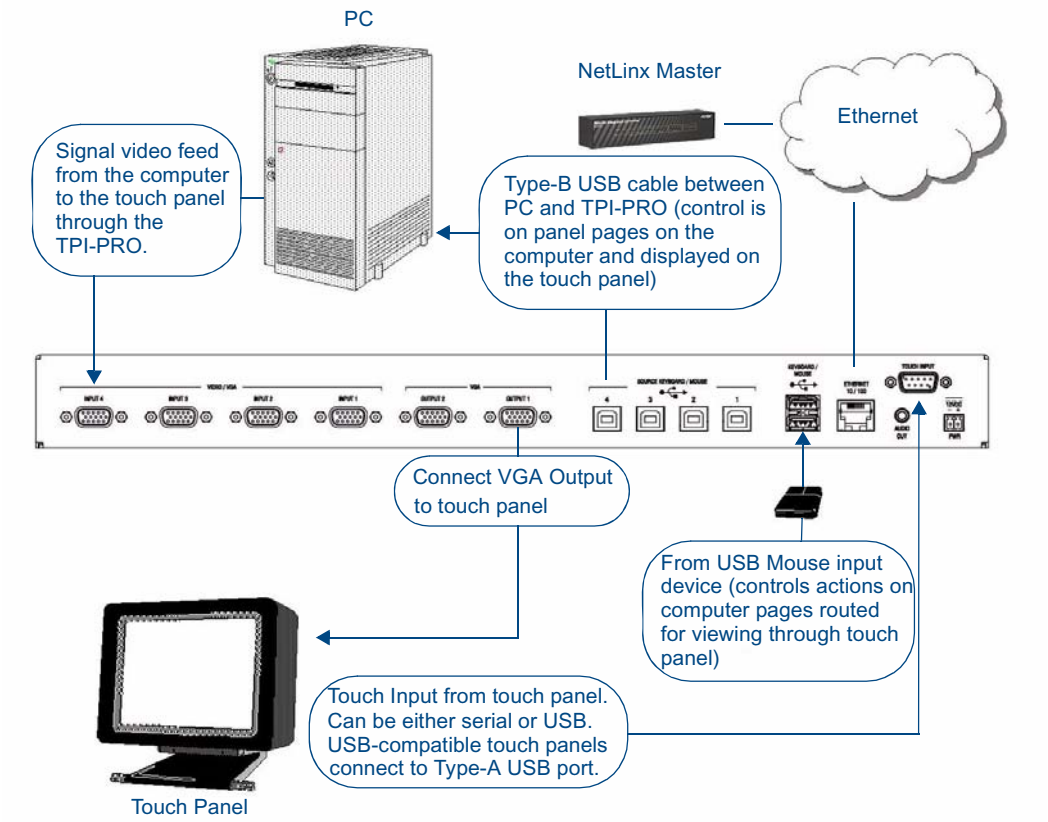


FIG. 10 System Installation Example 3 (Using a Touch Panel for Mouse / Touch Pass-Thru Control)

To enable a touch response on a panel page being routed through a computer, you must establish pass-thru enabling. Pass-thru control allows the TPI-PRO to act as a control bridge between a computer and a touch panel.

The touch panel control option is available by either selecting a *Video Fill* (select **Yes** from the **Windows >> Properties >> States** TPD4 drop-down menu to enable the option) or by enabling pass through via the ^PPS command. With Video Pass-Thru enabled, the panel's touch coordinates are passed as USB commands from the HD-15 connector on a TPI-PRO to the connected PC. This feature works only if the HD-15 connector is connected directly to the PC via the HD-15 port on the rear of the TPI-PRO. The touch coordinates are scaled to fit the resulting window. This allows you to "synch" the touch actions from the panel to those on the connected computer.

Computer control can be established by routing the Mouse and touch panel input control through the TPI-PRO. In this scenario, the TPI-PRO is virtually non-existent and is akin to connecting the touch panel and mouse directly to the rear of the computer. The computer views the TPI-PRO and the HD-15 and USB connectors as an adapter connected to a USB mouse device. **This method allows for both mouse and touch panel input control of the computer** (as seen in FIG. 10).

Follow these steps to configure the TPI-PRO to use a touch panel for touch and mouse pass-thru control:

1. Discharge any acquired static electricity by touching a grounded metal object.
2. Disconnect any incoming power connector from the rear of the TPI-PRO.
3. Connect a USB mouse to the TPI-PRO unit.
4. Connect a USB cable from a rear USB connector port (on the computer) to the Type-B USB device port input connector on the rear of the TPI-PRO.
5. Connect a HD-15 cable from the rear video port (on the computer) to one of the HD-15 source input connectors on the rear of the TPI-PRO.
6. Connect a DB9 touch input cable from the touch panel to the DB9 TOUCH INPUT connector on the rear of the TPI-PRO unit, or connect the cable from a USB touch monitor to the USB Type-A port on the TPI-PRO unit. Touch panels can connect to either the TOUCH INPUT connector or one of the Type-A USB ports, depending on the compatibility of the touch panel.
7. Connect the touch panel's HD-15 video cable to one of the VGA OUTPUT ports on the rear of the TPI-PRO.
8. Cycle power the unit. Cycling the unit allows it to detect the new configuration.
9. Code a button on the touch panel page to enable the pass-thru feature on a selected input card slot. Refer to the *^PPS* section on page 120 for the specific command parameters to enable the Mouse Pass-thru command on the TPI-PRO. Toggling this coded panel button can enable/disable the pass-thru feature.



You must set the TPI-PRO to match the resolution of the touch panel's video output resolution, then select a touch driver. The video should automatically fill-in the available screen area on the touch panel. It is possible the image generated from the TPI-PRO could be slightly "off", in which case you should adjust the image using the CRT's on-board video adjustment buttons.

10. Setup the TPI-PRO output resolution using the procedures in the *Setting the Output Resolution on the TPI-PRO* section on page 26.



If the TPI-PRO is turned off and then has power re-applied (power cycling), video alignment settings established through the Video and/or RGB pages could be reset unless the adjusted values have been previously saved. Refer to the Video Settings Page section on page 54 *for more information.*

11. Setup the touch drivers for the connected touch panel by using the procedures in the *Setting the Touch Drivers* section on page 27.
12. If necessary, use the panel's video adjust buttons to align the incoming video signal to fit into the available screen area. Initially positioning the TPI-PRO incoming video can reduce any later adjustments of the video through the RGB Setup page (H-position, V-position, H-size, etc.)

Connector Details and Pinout Configurations

The following sections describe in detail each of the connectors on the the TPI-PRO:

VIDEO/VGA INPUT Connectors



FIG. 11 VIDEO/VGA INPUT Connectors

The Video/VGA Input connectors are used for source input devices (4 on the TPI-PRO-4, 2 on the TPI-PRO-2). Each connector supports VGA graphics, S-video, composite video, and component video. The TPI-PRO routes the video from the connected input devices to any connected output devices.

VGA OUTPUT (HD-15) Connectors



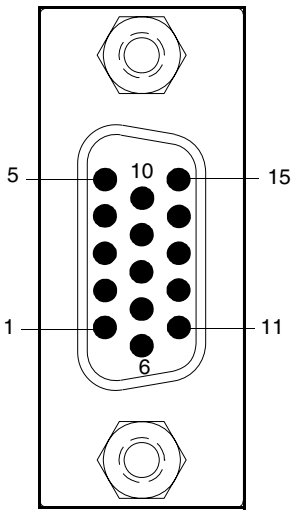
FIG. 12 VGA Output Connectors

Each TPI-PRO has two VGA Output connectors. You can connect the VGA source equipment HD-15 (male) connector (from the touch device) to the VGA OUT HD-15 high-density connector (female) on the rear panel of the TPI-PRO. The output devices display video from source input devices routing through the TPI-PRO.

The following tables list the VGA OUT HD-15 connector pinouts.

VGA OUT HD-15 Connector Pinouts

Pin	Signal	Function
1	Red	Red signals
2	Green	Green signals
3	Blue	Blue signals
4	Sense 2	Monitor ID bit 2
5	GND	Signal Ground
6	RAGND	Red analog ground
7	GAGND	Green analog ground
8	BAGND	Blue analog ground
9	N/A	Not used
10	SAGND	Synchronization analog ground
11	Sense 0	Monitor ID bit 0
12	Sense 1	Monitor ID bit 1
13	HSYNC	Horizontal synchronization signal
14	VSYNC	Vertical synchronization signal
15	Sense 3	Monitor ID bit 3



VGA HD-15 (male) connector

The following table lists the pinout configuration for HD-15 connector to S-Video connectors:

VGA IN to S-Video Pinouts

VGA Pin	VGA Signal	S-Video Signal	S-Video Connector Pin
1	Red		
2	Green	Luminance (Y)	3
3	Blue	Chrominance (C)	4
4	Sense 2		
5	GND		
6	RAGND		
7	GAGND	Luminance (Y)- Return	1
8	BAGND	Chrominance (C) - Return	2
9	N/A		
10	SAGND		
11	Sense 0		
12	Sense 1		
13	HSYNC		
14	VSYNC		
15	Sense 3		

The following table lists the pinout configuration for HD-15 connector to Component (RGB) connectors:

VGA IN to Component (RGB) Pinouts					
VGA Pin	VGA Signal	Component Signal	Red RCA	Green RCA	Blue RCA
1	Red	Pr signal	center pin		
2	Green	Y signal		center pin	
3	Blue	Pb signal			center pin
4	Sense 2				
5	GND				
6	RAGND	Pr - Return	shield		
7	GAGND	Y - Return		shield	
8	BAGND	Pb - Return			shield
9	N/A				
10	SAGND				
11	Sense 0				
12	Sense 1				
13	HSYNC				
14	VSYNC				
15	Sense 3				

The following table lists the pinout configuration for HD-15 connector to Composite (BNC) connectors:

VGA IN to Composite Pinouts							
VGA Pin	VGA Signal	Composite Signal	Red BNC	Green BNC	Blue Coax	Black BNC	Grey Coax
1	Red	Red Signal	center pin				
2	Green	Green Signal		center pin			
3	Blue	Blue Signal			center pin		
4	Sense 2						
5	GND	HSync Return					shield
6	RAGND	Red Return	shield				
7	GAGND	Green Return		shield			
8	BAGND	Blue Return			shield		
9	N/A						
10	SAGND	VSync Return				shield	
11	Sense 0						
12	Sense 1						
13	HSYNC	HSync Signal					center pin
14	VSYNC	VSync Signal				center pin	
15	Sense 3						

SOURCE KEYBOARD/MOUSE (USB-Type B) Ports

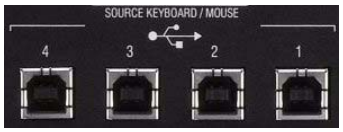


FIG. 13 SOURCE KEYBOARD/MOUSE (USB-Type B) Ports

You can connect up to four USB Type-B Host PC connections for TOUCH, Mouse and Keyboard pass-through to the PC (two on the TPI-PRO-2, four on the TPI-PRO-4) via the SOURCE KEYBOARD/MOUSE USB connectors.

NOTE

If you experience problems introducing new devices, you can install the drivers on a remote PC according to manufacturer suggestions with the device connected directly to the remote PC.

To connect a host touch monitor, mouse, or keyboard to the TPI-PRO, insert the host PC USB connectors into the appropriate USB Type-B connector on the TPI-PRO.

Notes on USB Device Connections

USB-connected input devices are detected and recognized by the unit upon connection. Removing and reconnecting USB devices from the TPI-PRO may result in a loss of connectivity. If this occurs, resetting the unit will allow the devices to re-establish connectivity.

- When disconnecting a USB device, wait 5-10 seconds before reconnecting or connecting a new device to allow the TPI-PRO to recognize that the first device is disconnected. If connectivity is lost, reset the TPI-PRO to allow re-establishment of the connection.
- Using a USB hub may cause functionality issues with all USB ports on the TPI-PRO. Do not use a USB hub to connect multiple USB devices to the TPI-PRO.
- USB 2.0 support is required for all USB devices.

TOUCH INPUT (DB9) Port

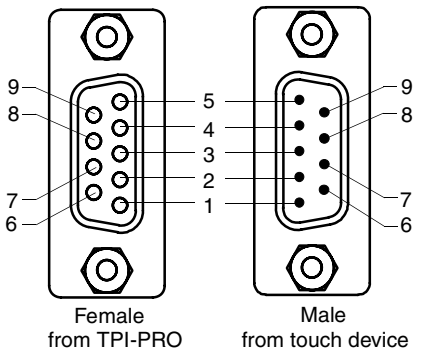


FIG. 14 TOUCH INPUT (DB9) Port

The RS-232 (DB9) 9-pin serial port provides connectivity to a pointer device (i.e. touch screen) that requires a serial connection.

The following table lists the RS-232 connector pinouts.

(DB9) RS-232 Connector Pinouts		
Pin	Signal	Function
1	N/A	Not used
2	RXD	Receive data
3	TXD	Transmit data
4	DTR	Data terminal ready
5	GND	Signal ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear to send
9	N/A	Not used



ETHERNET (RJ-45) Port



FIG. 15 ETHERNET (RJ-45) Port

The RJ-45 port provides 10/100 Mbps communication communicates with the NetLinx Master (via ICSP protocol over Ethernet). The Ethernet port automatically negotiates the connection speed (10 Mbps or 100 Mbps), and whether to use half duplex or full duplex mode. This communication is reflected via the front ICSP LED.

FIG. 16 describes the blink activity for the ETHERNET 10/100 Base-T RJ-45 connector and cable.

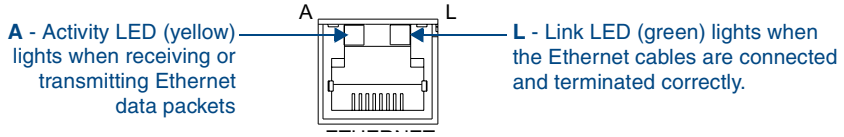


FIG. 16 ETHERNET connector / LEDs

The following table lists the pinouts, signals, and pairing associated with the ETHERNET connector.

Ethernet RJ-45 Pinouts and Signals

Pin	Signals	Connections	Pairing	Color
1	TX +	1 --------- 1	1 --------- 2	Orange-White
2	TX -	2 --------- 2		Orange
3	RX +	3 --------- 3	3 --------- 6	Green-White
4	no connection	4 --------- 4		Blue
5	no connection	5 --------- 5	4 --------- 5	Blue-White
6	RX -	6 --------- 6		Green
7	no connection	7 --------- 7	7 --------- 8	Brown-White
8	no connection	8 --------- 8		Brown

FIG. 17 diagrams the RJ-45 pinouts and signals for the ETHERNET RJ-45 connector and cable.

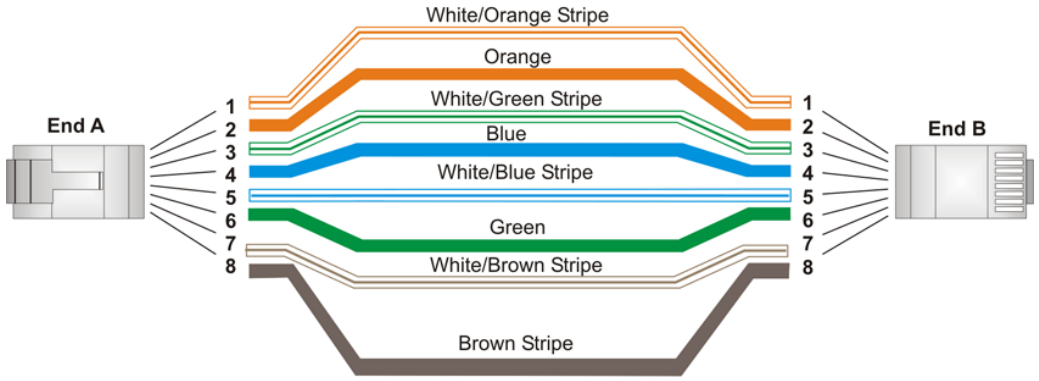


FIG. 17 RJ-45 wiring diagram

Power (2-Pin Captive Wire) Connector



FIG. 18 Power (2-Pin Captive Wire) Connector

The TPI-PRO requires a 12 VDC-compliant power supply to provide power to the TPI-PRO via the 2-pin 3.5 mm mini-Phoenix PWR connector. The incoming PWR and GND wires from the power supply must be connected to the corresponding locations within the PWR connector.

CAUTION

*Do not connect power to the TPI-PRO until wiring is complete. These units should only have one source of incoming power. Using more than source of power to the panel can result in damage to the internal components and a possible burn out. Apply power to the panels **only after** installation is complete.*

To use the 2-pin 3.5 mm mini-Phoenix connector for use with a 12 VDC-compliant power supply, the incoming PWR and GND wires from the external source must be connected to their corresponding locations on the connector (FIG. 19).

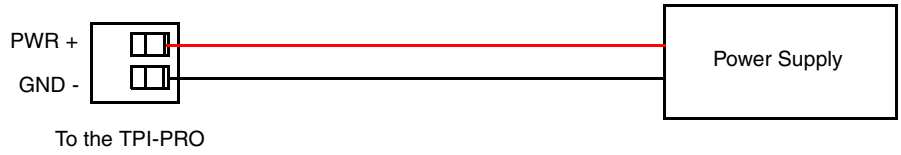


FIG. 19 NetLinx power connector wiring diagram

WARNING

Never pre-tin wires for compression-type connections.

1. Strip 0.25 inch (6.35 mm) of insulation off all wires.
2. Insert the PWR and GND wires on the terminal end of the 2-pin 3.5 mm mini-Phoenix cable. ***Match the wiring locations of the +/- on both the power supply and the terminal connector.***
3. Tighten the clamp to secure the two wires. *Do not tighten the screws excessively; doing so may strip the threads and damage the connector.*
4. Verify the connection of the 2-pin 3.5 mm mini-Phoenix to the external 12 VDC-compliant power supply.

TPI-PRO and Panel Interface Setup

The information contained within this section refers to the procedures necessary to set up the TPI-PRO resolution, assign a touch driver, and calibrate the driver for use with a connected touch panel.



Verify you are using the latest NetLinx Master firmware.
Verify you are using the latest TPI-PRO firmware.
Verify the NetLinx Studio program you are using is version 2.4 or higher.
Verify the TPDesign4 program you are using is version 2.8 or higher.

The TPI-PRO has been factory setup with specific touch panel pages. The first splash screen that appears indicates the TPI-PRO is receiving power, loading firmware, and preparing to display the default touch panel page. When the panel is ready, the AMX Splash Screen is replaced by the Initial Panel Setup page.

TPI-PRO Startup Routine and Initial Panel Response

1. Discharge any acquired static electricity by touching a grounded metal object.
2. Verify the rear connections are secure and active. Refer to the *Wiring and Device Connections* section on page 11for more detailed cable connector information.
3. Connect the terminal-end of the PSN into an outlet to begin powering-up the unit and initializing the startup routine.
4. After the startup routine, the connected touch panel displays one of two possible screens:
 - If the resolution of the TPI-PRO matches the supported resolution of the panel, continue by setting the touch drivers associated with the LCD (if any). Refer to the *Setting the Touch Drivers* section on page 27.
 - If the TPI-PRO output resolution **does not match the resolution** of the connected panel, an **OUT OF RANGE** message appears, and **you must use the following steps to adjust the output resolution of the TPI-PRO to match the panel.**
 This feature is monitor dependant and the range message is generated by the monitor (not by the TPI-PRO). Some monitors do not display a message, but instead appear blank.

Setting the Output Resolution on the TPI-PRO

To correct the problem of an **OUT OF RANGE** message, the TPI-PRO output resolution must be set to match the same output pixel resolution and refresh rate set on the connected panel/monitor.

The default TPI-PRO output resolution is 1280 x 1024@60Hz. Use the front panel RESOLUTION button to alter the outgoing resolution (*for a maximum of 1920 x 1200@60 Hz*).

1. Press the RESOLUTION button on the front panel. This single press opens the Resolution Setup page (FIG. 20).

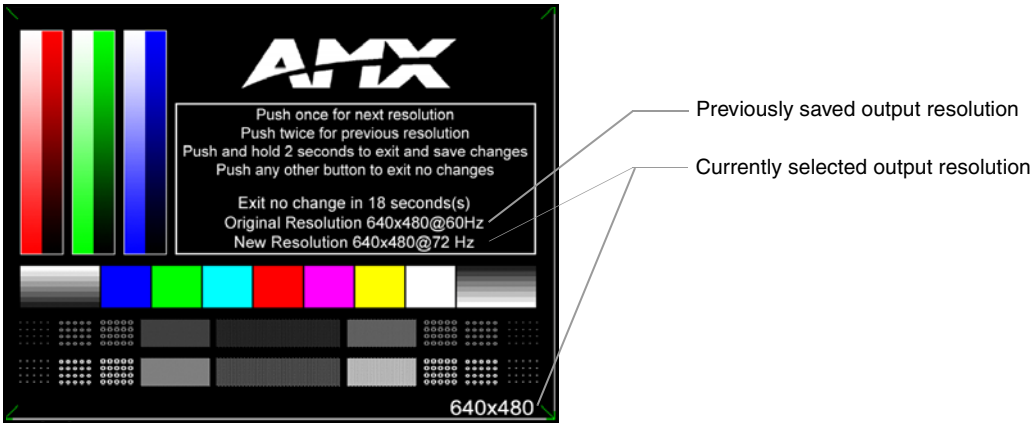


FIG. 20 Resolution Setup page (showing comparative resolutions)

NOTE

Setting the resolution begins by displaying a comparison of the current/original output resolution of the TPI-PRO (on one line) and then displaying the first selectable display resolution and refresh rate (on the next line). The selection process originates at a 1280x1024@60Hz display option and with every consecutive single push of the RESOLUTION button, the TPI-PRO resolution increases to a maximum output of 1920x1200@60Hz.

2. Firmly press the RESOLUTION button again to cycle through the available resolution settings. ***Every consecutive button push cycles the output resolution to the next highest available setting. A double-push of the RESOLUTION button adjusts the resolution to previous setting.*** For a listing of available pixel display and refresh rates, see the *List of Available Pixel Display and Refresh Rates* section on page 140.

If your panel does not match the initial TPI-PRO output resolution, you must perform these manual setting procedures to "sync-up" both device settings.

NOTE

Once your resolution is selected, you can use the outer screen area lines on the Resolution Setup page to adjust your CRT monitor's visible screen area. This could involve using the monitor's video control to stretch and move the incoming video so that the borders follow the edges of the screen without disappearing. There are normally 60 seconds before the resolution times-out, but you can press the front panel Resolution button to continue.

3. After choosing the desired resolution, use the monitor's video controls to stretch and move the incoming video so the borders of the desired resolution pattern follow the edges of the screen without disappearing. There are normally 60 seconds before the resolution times-out, but you can press the front panel RESOLUTION button again to return to the previous resolution pattern and continue setting-up the monitor.

4. Press and hold-down firmly the RESOLUTION button to save the resolution setting. A message stating: "***Please wait, loading new resolution...***" appears to indicate the new resolution being is saved. The Resolution Setup page then displays and exits the resolution setup process. ***There is then some shifting of the defaulted Main page (which was developed for a 1280 x 1024 resolution).***
5. Press the front panel TOUCH button to proceed with setting the Touch Drivers (*see the Setting the Touch Drivers* section on page 27).

NOTE

You set the touch drivers when you connect the TPI-PRO to a touch panel.
If you are using a CRT monitor, set the touch drivers to NullTouch.

Setting the Touch Drivers

This step only applies to serial touch montors. USB monitors are automatically detected. After matching the resolution between the TPI-PRO and panel/monitor, the next step is to select the necessary touch drivers from the available series provided through the TPI-PRO.

1. Press the TOUCH button on the front panel of the TPI-PRO to set the touch driver and open the on-screen Panel Information page (FIG. 21). The default Touch Input Driver is **EloTouch**®.

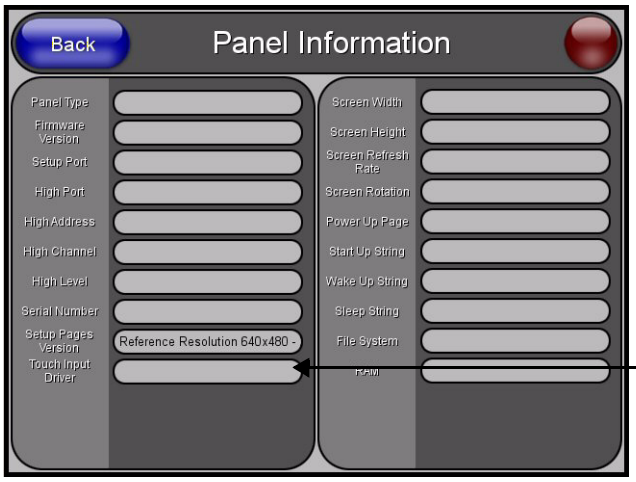


FIG. 21 Panel Information page

2. Press the front panel TOUCH button to cycle through a series of available touch input drivers. For a list of current compatible touch drivers, visit **www.amx.com**.

Verify that the selected touch driver matches the connected touch panel or monitor. Refer to the *List of Available Pixel Display and Refresh Rates* section on page 140 for a comprehensive list of Touch Monitors that have been tested with the TPI-PRO.

Calibrating the TPI-PRO Using a USB Input

1. Connect a USB cable from a touch panel to one of the Type-A USB ports on the front or back of the TPI-PRO.
2. Reboot the TPI-PRO by pressing the power button on the unit so the unit can detect the new hardware.
3. Press the CALIBRATE button on the front panel. This process opens a calibration page that uses a series of crosshair coordinate intersections to calibrate the touch panel (using the newly selected touch driver).

NOTE

If the wrong touch driver is selected prior to the calibration process, press any front-panel button to exit the calibration process and re-select another touch driver. If you are using a CRT monitor, DO NOT PRESS THE CALIBRATE BUTTON. Refer to the Setting the Output Resolution on the TPI-PRO section on page 26 *for CRT screen adjustment procedures.*

4. Press the crosshairs (on the Calibration page) to set the calibration points on the LCD.
5. After the "***Calibration Successful.***" message appears, press anywhere to return to the Setup page. If the calibration fails, attempt to calibrate again. If unsuccessful, call AMX Tech Support.

NOTE

It is recommended that you calibrate the TPI-PRO before its initial use, after completing a firmware download, and after switching touch input drivers (and touch devices.)

6. Press the **Protected Setup** button (located on the lower-left of the panel page) to open the Protected Setup page.
7. Enter ***1988*** into the Keypad's password field and press **Done** when finished.
8. Press the on-screen **Reboot** button to cycle power to the TPI-PRO and incorporate the new settings. The touch monitor goes blank for a few seconds during the reboot process. You can also use a mouse to press the on-screen **Reboot** button.

Calibrating the TPI-PRO Using a Serial Touch Panel

1. Connect a DB9 cable from a touch panel to the DB-9 touch input connector on the back of the TPI-PRO.
2. Reboot the TPI-PRO by pressing the power button on the unit so the unit can detect the new hardware.
3. Press the CALIBRATE button on the front panel. This process opens a calibration page that uses a series of crosshair coordinate intersections to calibrate the touch panel (using the newly selected touch driver).

NOTE

If the wrong touch driver is selected prior to the calibration process, press any front-panel button to exit the calibration process and re-select another touch driver. If you are using a CRT monitor, DO NOT PRESS THE CALIBRATE BUTTON. Refer to the Setting the Output Resolution on the TPI-PRO section on page 26 *for CRT screen adjustment procedures.*

4. Press the crosshairs (on the Calibration page) to set the calibration points on the LCD.
5. After the "***Calibration Successful.***" message appears, press anywhere to return to the Setup page. If the calibration fails, return to the Protected Setup page and select another touch input driver.

NOTE

It is recommended that you calibrate the TPI-PRO before its initial use, after completing a firmware download, and after switching touch input drivers (and touch devices.)

6. Press the **Protected Setup** button (located on the lower-left of the panel page) to open the Protected Setup page.
7. Enter ***1988*** into the Keypad's password field and press **Done** when finished.
8. Press the on-screen **Reboot** button to cycle power to the TPI-PRO and incorporate the new settings. The touch monitor goes blank for a few seconds during the reboot process. You can also use a mouse to press the on-screen **Reboot** button.
9. Upon start-up, press anywhere on the screen to return to the Protected Setup page and begin defining the communication properties.

Configuring Communication

Communication between the TPI-PRO and the NetLinx Master consists of using an Ethernet connection (DHCP or Static IP).

NOTE

If you are currently using a static IP Address, continue with the IP Settings section - Configuring a Static IP Address over Ethernet section on page 33.

WARNING

Before commencing, verify you are using the latest NetLinx Master firmware. Verify the NetLinx Studio program being used is version 2.4 or higher.

Setting up the TPI-PRO Device Number

1. Press the front panel SETUP button to open the Setup page.

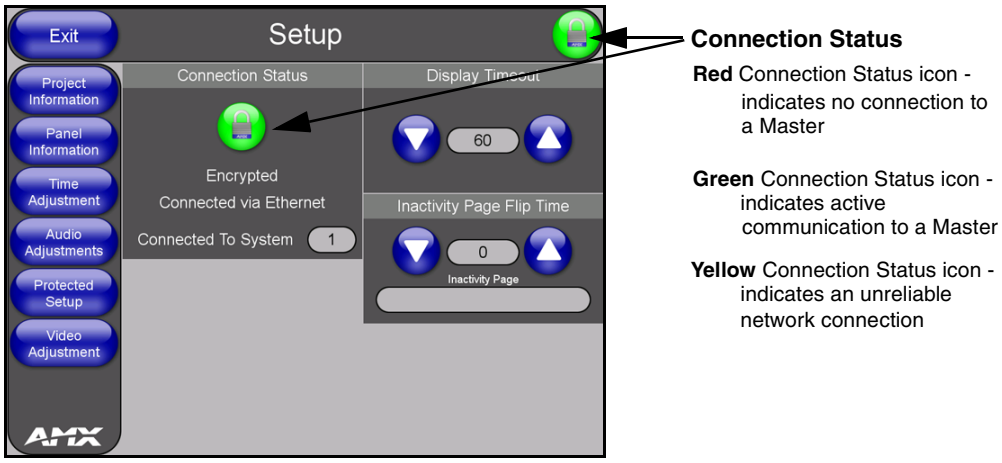


FIG. 22 Setup page

2. Press the **Protected Setup** button (located on the lower-left of the page) to open the Protected Setup page and display an on-screen keypad.
3. Enter ***1988*** into the Keypad's password field and press **Done** when finished.

NOTE

Clearing Password #5, from the initial Password Setup page, removes the need for you to enter the default password before accessing the Protected Setup page.

4. Press the red *Device Number* field to open the Device Number keypad (FIG. 23).
5. Enter a **Device Number** value for the panel into the Device Number Keypad**.**
 The default value is 10001, and the range is from 1 - 32000.

NOTE

When using multiple TPI-PROs within a NetLinx System, remember to assign unique Device Number values to each panel so that all assigned panels appear in the System listing for the target Master.

6. Press **Done** to close the keypad, assign the number, and return to the Protected Setup page.

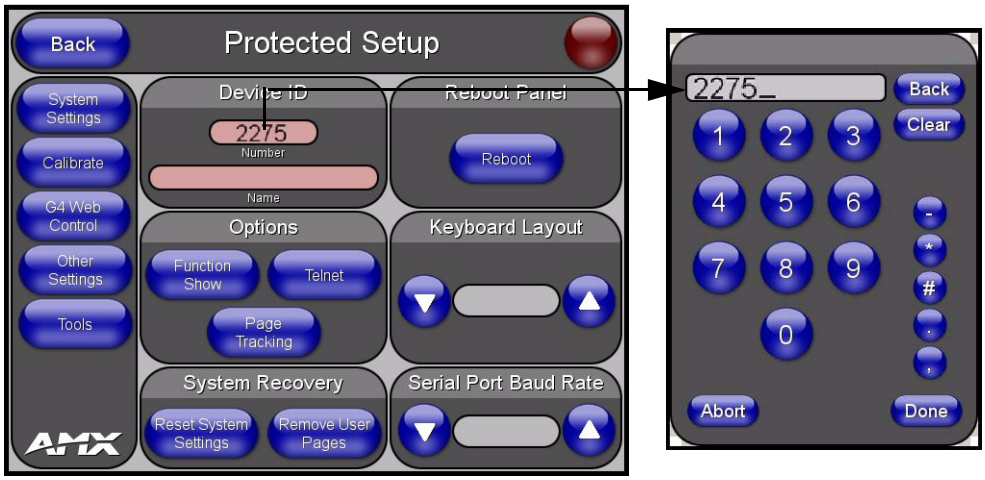


FIG. 23 Protected Setup page with Keypad

7. Use the Baud Rate **Up/Down** arrows to cycle through the available baud rates for TPI-PRO serial communication to the connected PC. *The default is 38400.*

NOTE

Before continuing, open NetLinx Studio. This program assists in developing a System Number, Master IP/URL, and Master Port number. Refer to your NetLinx Master's instruction manual for more information.

8. Obtain the System Number and Master IP Address from NetLinx Studio. This information must be specific for the system used with the configured TPI-PRO.
9. Press the **System Settings** button (located on the Protected Setup page) to open the System Settings page (FIG. 24) and begin configuring the communication settings on the TPI-PRO to match those of the target Master.

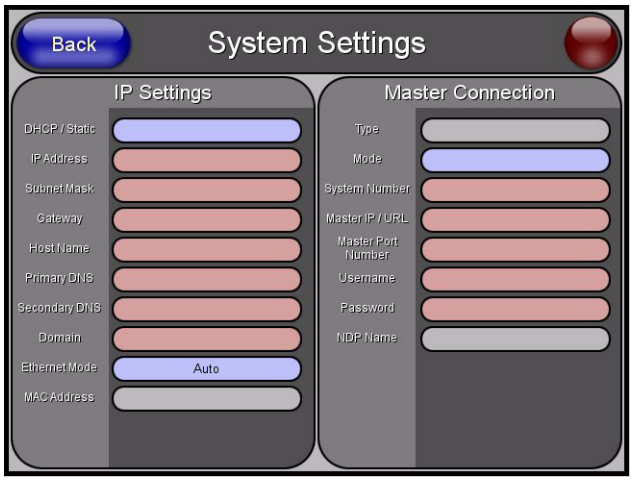


FIG. 24 System Settings page

10. Press the on-screen **Reboot** button to restart the TPI-PRO and incorporate any changes.

Configuring a Wired Ethernet Connection

It is necessary to tell the panel with which Master it should be communicating. "Pointing to a Master" is configured via the System Connection page where you configure the IP Address, System Number, and Username/Password information assigned to the target Master. Until you configure these parameters, your Connection Status icon remains red, indicating there is no current connection to a Master.

Step 1: Configuring the Panel's IP Settings

You can only configure the connection parameters for the TPI-PRO through the System Connection page. You can configure this type of communication via either a Dynamic IP Address (*DHCP*) or via a pre-reserved Static IP Address (typically provided by your System Administrator).

IP Settings section - Configuring a DHCP Address over Ethernet

1. Select **Protected Setup > System Connection** (located on the lower-left) to open the System Connection page.
2. Locate the IP Settings section of this page.
3. Toggle the **DHCP/Static** field in the IP Settings section until the choice cycles to DHCP.



DHCP registers the unique MAC address (factory assigned) on the TPI-PRO. Once the communication setup process is complete, reserves an IP Address, Subnet Mask, and Gateway values from the DHCP Server.

4. Press the optional **Host Name** field to open a Keyboard and enter the Host Name information.
5. Press **Done** after you are finished assigning the alpha-numeric string of the host name.
6. Do not alter any of the remaining greyed-out fields in the IP Settings section. Once the TPI-PRO is rebooted, these values are obtained by the unit and displayed in the DNS fields after power-up.
7. Press the **Back** button to return to the Protected Setup page.
8. Press the on-screen **Reboot** button to both save any changes and restart the TPI-PRO.

IP Settings section - Configuring a Static IP Address over Ethernet

1. Select **Protected Setup > System Connection** (located on the lower-left) to open the System Connection page.
2. Locate the IP Settings section of this page.



Check with your System Administrator for a pre-reserved Static IP Address assigned to the TPI-PRO. You must obtain this address before continuing to assign it to the TPI-Pro.

3. Toggle the **DHCP/Static** field in the IP Settings section)until the choice cycles to Static.
4. Press the **IP Address** field to open a Keyboard and enter the static IP address provided by your System Administrator.
5. Press **Done** after you are finished entering the IP information.
6. Repeat the same process for the Subnet Mask and Gateway fields.
7. Press the optional Host Name field to open the Keyboard and enter the Host Name information.
8. Press **Done** after you are finished assigning the alpha-numeric string of the host name.
9. Press the **Primary DNS** field to open a keyboard, enter the Primary DNS address provided by your System Administrator, and press **Done** when compete. Repeat this process for the Secondary DNS field.

10. Press the **Domain** field to open a keyboard, enter the resolvable domain address (this is provided by your System Administrator and equates to a unique Internet name for the TPI-PRO.) Press **Done** when complete.
11. Press the **Back** button to return to the Protected Setup page.
12. Press the on-screen **Reboot** button to both save any changes and restart the TPI-PRO.
13. Navigate to the Master Connection section of this page to begin configuring the communication parameters for the target Master.

Step 2: Choosing a Master Connection Mode Setting

There are five Ethernet MODE settings used in the Master Connection section of the System Connection page. **URL is the most common method.** The following table describes the master connection mode options.

Master Connection Mode Options
URL (Uniform Resource Locator) is the address that defines the route to a file on the Web or any other Internet facility. In this system, the panel acts as a "Client" and the Master acts as a Server (in that Clients attach to it).
LISTEN sets the TPI-PRO to "listen" for connections from the Master (using the panel IP from its URL list). In this system, the TPI-PRO acts as a "Server" (in that Clients attach to it) and the Master acts as a "Client".
AUTO is used to instruct the TPI-PRO to search for a Master that uses the same System Number (assigned within the Master Connection section) and resides on the same Subnet as itself.
NDP (UDP) uses multicasting to allow devices to discover each other. The devices must be on a network that allows multicasting and is setup so that if the device and the Master are on separate subnets, the multicasting allows them to discover each other.
URL (UDP) is the address that defines the route to a file on the Web or any other Internet facility. In this system, the panel acts as a "Client" and the Master acts as a Server (in that Clients attach to it). In this case, the Master has its UDP feature enabled.

Step 3: Configuring the Ethernet Connection Type



When using Ethernet as your communication method, the NetLinx Master must first be setup with either a static IP or DHCP Address obtained from either NetLinx Studio or your System Administrator.

Before beginning:

1. Verify the TPI-PRO has been configured to communicate through an Ethernet cable connected from the rear of the TPI-PRO to a valid Ethernet Hub.



Before commencing, verify you are using the latest NetLinx Master firmware.

2. Verify that the NetLinx Master is receiving power and is communicating via an Ethernet connection with the PC running NetLinx Studio.
3. Connect the terminal end of the PSN power cable to the 12 VDC power connector on the rear of the TPI-PRO unit.



If you have not yet connected power and turned on TPI-PRO, continue with steps 4 - 7. These steps allow the panel to cycle through its available ports and detect any attached connectors. Otherwise, skip to step 8.

4. Connect the terminal end of the PSN power cable to the 12 VDC power connector on the rear of the TPI-PRO.
5. Verify the green Ethernet LED on the rear Ethernet port on both the Master and TPI-PRO are illuminated, indicating a proper connection.
6. Verify the green Ethernet LED on the rear Ethernet port on the Master is illuminated, indicating a proper connection.
7. Verify the yellow LED on the rear Ethernet port on the Master is blinking, indicating communication.
8. After the TPI-PRO powers-up, press the front panel SETUP button to continue with the setup process by proceeding to the Setup page.
9. Select **Protected Setup > System Settings** located on the lower-left section of the page to open the System Settings page (FIG. 25).

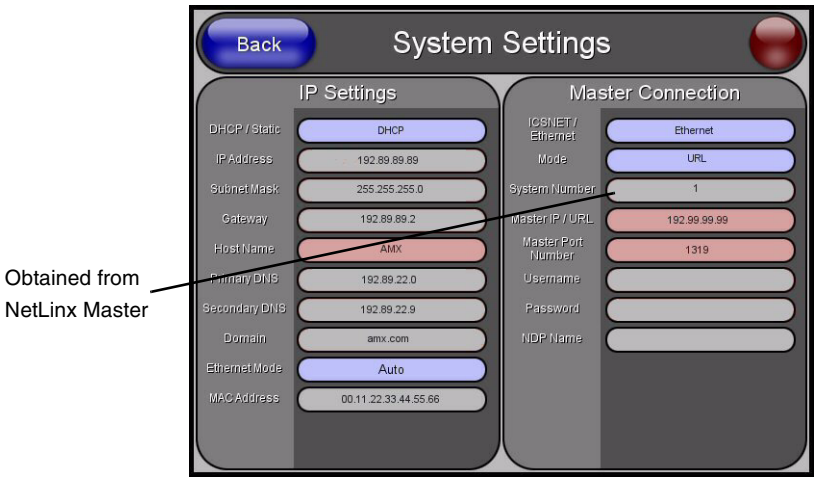


FIG. 25 System Settings page

Master Connection section - NetLinx Master Ethernet IP Address - URL Mode

In this mode, enter the System Number (zero for an unknown System Number) and the IP/URL of the Master (Master Port Number is defaulted to **1319**).

1. Press the **Mode** field until the option cycles to URL. By selecting **URL**, the System Number field becomes read-only (grey) because the panel pulls this value directly from the communicating target Master.

NOTE

If the TPI-PRO does not appear within the Online Tree tab of the Workspace window of NetLinx Studio, check to make sure that the NetLinx Master System Number (from the Device Addressing dialog box) is correctly assigned.

2. Press the Master IP/URL field to open an on-screen keyboard, and enter the Master IP address or URL (obtained from the Diagnostics - Networking Address dialog box in the NetLinx Studio application).
3. Click **Done** to accept the new value and return to the System Configuration page.
4. Do not alter the Master Port Number value (this is the default value used by NetLinx).
5. Enter a username and password in their respective fields if the target Master has been previously secured.
6. Press the **Back** button to open the Protected Setup page.

7. Press the on-screen **Reboot** button to both save any changes and restart the TPI-PRO.

Master Connection section - NetLinx Master Ethernet IP Address - Listen Mode

In this mode, you must add the TPI-PRO IP address into the URL List of the Master (using NetLinx Studio). This mode sets the TPI-PRO to "listen" for connections from the Master (using the TPI-PRO's IP from its URL list).

1. Obtain either a Static IP for the TPI-PRO from your System Administrator or a DHCP Address from the IP Settings of the System Connection page. The DHCP/Static field in the IP Settings section of the System Connection page must be set to DHCP to get Dynamic IP information for the TPI-PRO.
2. Press the on-screen **Reboot** button on the Protected Setup page to both save any changes and restart the TPI-PRO.
3. After power-up, press the front panel SETUP button to access the Setup page.
4. Navigate to the **Setup > Protected Setup > System Settings** page and note the newly obtained Dynamic IP Address information from the IP Settings section. This information is then entered into the URL List for the connected NetLinx Master.
5. Press the Type field in the Master Connection section until the option cycles to Ethernet.
6. To set the connection mode, press the **Mode** field until the option cycles to Listen.
7. Enter a username and password in their respective fields if the target Master has been previously secured.
8. Select the **Online Tree** tab from the Workspace window.
9. Select **Diagnostics > URL Listing** from the Main menu (FIG. 26).

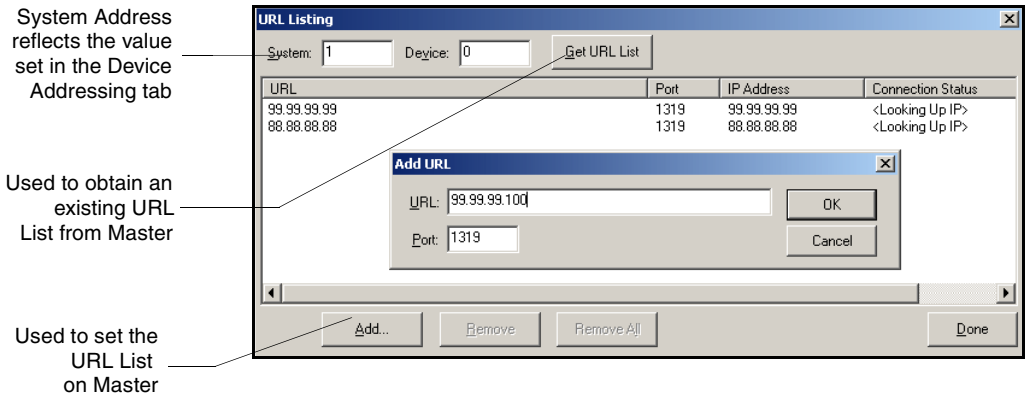


FIG. 26 URL List dialog

10. Enter the **System** and **Device** number for the specific Master associated with your TPI-PRO, as seen in the Online Tree tab.
11. Click **Add**, and enter the IP address of the TPI-PRO into the Add URL dialog box.
12. Click **OK** to enter your IP address and add it to the list.
13. Click **Done** once you are finished adding your TPI-PRO information to the list.
14. Press the on-screen **Reboot** button to save any changes and restart the TPI-PRO.

Master Connection section - NetLinx Master Ethernet IP Address - Auto Mode

In this mode, enter the System Number of the NetLinx Master. This mode instructs the TPI-PRO to search for a Master that uses the same System Number (assigned within the Master Connection section) and resides on the same Subnet as the TPI-PRO.

1. Press the **Mode** field until the option cycles to Auto.
2. Press the **System Number** field to launch an on-screen keypad, and enter the value for the system number of the NetLinx Master. You can obtain this value from the NetLinx Studio program > OnLine Tree of the Workspace window.
3. Do not alter the IP settings on the System Connection page, as this field is not applicable to this connection mode.
4. Enter a username and password into their respective fields if the target Master has been previously secured.
5. Press the on-screen **Reboot** button to both save any changes and restart the TPI-PRO.
6. Press the front panel SETUP button to open the Setup page and confirm there is an active connection.



The NetLinx Master and the TPI-PRO must both be on the same Subnet.

Master Connection section - NetLinx Master Ethernet IP Address - NDP (UDP) Mode

In this mode, you must make a connection through the Master's web page to bind the TPI-PRO to the Master.

1. Press the **ICSNET/Ethernet** field in the Master Connection section until the option cycles to Ethernet.
2. Press the **Mode** field until the option cycles to NDP (UDP).
3. Press the on-screen **Reboot** button to both save any changes and restart the TPI-PRO.
4. Open a web browser on a PC that has access to the Master to which you want to connect, type the IP address of the Master in the Address bar, and press **Enter**. The Master Configuration Manager page for the Master opens.
5. Click **System** on the Master Configuration Manager page.
6. Click **Manage NetLinx** on the System page.
7. Locate the TPI-PRO you want to connect to the Master, and click **Bind**. The Bind button is located on the same line as the TPI-PRO. The Master refreshes and shows that the TPI-PRO is bound to it. The TPI-PRO remains bound to the Master and will connect to it whenever you reboot the TPI-PRO.



If the TPI-PRO does not appear within the OnLine Tree tab of the Workspace window of NetLinx Studio, check to make sure that the NetLinx Master System Number (from the Device Addressing dialog box) is correctly assigned.

Master Connection section - NetLinx Master Ethernet IP Address - URL (UDP) Mode

In this mode, enter the System Number (zero for an unknown System Number) and the IP/URL of the Master (Master Port Number is defaulted to **1319**).

1. Press the **Mode** field until the option cycles to URL (UDP). By selecting **URL (UDP)**, the System Number field becomes read-only (grey) because the panel pulls this value directly from the communicating target Master.
2. Press the *Master IP/URL* field to open an on-screen keyboard, and enter the Master IP Address (obtained from the Diagnostics - Networking Address dialog in the NetLinx Studio application).
3. Click **Done** to accept the new value and return to the System Configuration page.
4. Do not alter the Master Port Number value. (This is the default value used by NetLinx).
5. Enter a username and password into their respective fields if the target Master has been previously secured.
6. Press the **Back** button to open the Protected Setup page.
7. Press the on-screen **Reboot** button to both save any changes and restart the TPI-PRO.



If the TPI-PRO does not appear within the OnLine Tree tab of the Workspace window of NetLinx Studio, check to make sure that the NetLinx Master System Number (from the Device Addressing dialog box) is correctly assigned.

Using G4 Web Control® to Interact with a G4 Panel

The G4 Web Control feature allows you to use a PC to interact with a G4 enabled device via the web. This feature works in tandem with the new browser-capable NetLinx Security firmware update (build 300 or higher). G4 Web Control is only available with the latest TPI-PRO firmware.

Refer to the *G4 Web Control Page* section on page 61 for more detailed information.



*Verify your NetLinx Master (ME260/64 or NI-Series) has been installed with the latest firmware KIT file from **www.amx.com**. Refer to your NetLinx Master Instruction Manual for more detailed information on the use of the new web-based NetLinx Security.*

1. Press the front panel SETUP button to access the Setup page.
2. Press the **Protected Setup** button (located on the lower-left of the firmware page) to open the Protected Setup page and display an on-screen keypad.
3. Enter ***1988*** into the keypad's password field (1988 is the default password).



Clearing Password #5, from the initial Password Setup page, removes the need for you to enter the default password before accessing the Protected Setup page.

4. Press **Done** when finished.

5. Press the **G4 Web Control** button to open the G4 Web Control page (FIG. 27).



FIG. 27 G4 Web Control page

6. Press the **Enable/Enabled** button until it toggles to **Enabled** (*light blue color*).
7. The **Network Interface Select** field is read-only for the TPI-PRO and uses **Wired** as the default method of communication to the web.
 - **Wired** is used when a direct Ethernet connection is being used for communication to the web. *This is the default setting if either no wireless interface card is detected or if both an Ethernet and wireless card connection is detected by the panel.*
 - The **Wireless** option is unavailable within TPI-PRO.
8. Press the **Web Control Password** field to open the Web Password keyboard.
9. From the Web Password keyboard, enter a unique alpha-numeric string to be assigned as the G4 Authentication session password associated with VNC web access of this TPI-PRO.
10. Press **Done** after you are finished assigning the alpha-numeric string for the Web Control password.
11. Press the **Web Control Port** field to open the Web Port Number keypad.
12. Within the keypad, enter a unique numeric value to be assigned to the port the VNC Web Server is running on. The default value is 5900.
13. Press **Done** when you are finished entering the value. The remaining fields within the G4 Web Control Settings section of this page are read-only and cannot be altered.
14. Press the **Up/Down** arrows on either sides of the G4 Web Control Timeout field to increase or decrease the amount of time the panel can remain idle (no cursor movements) before the session is closed and the user is disconnected.
15. Press the **Back** button to open the Protected Setup page.
16. Press the on-screen **Reboot** button to save any changes and restart the TPI-PRO.

NOTE

Verify your NetLinx Master's IP Address and System Number have been properly entered into the Master Connection section of the System Connection page.

Using your NetLinx Master to Control the Unit

Refer to your particular NetLinx Master's instruction manual for detailed information on how to download the latest firmware from **www.amx.com**.

Once the Master's IP Address has been set through NetLinx Studio (version 2.4 or higher):

1. Launch your web browser.
2. Enter the IP address of the target Master (***ex: http://198.198.99.99***) into the web browser's Address field.
3. Press the **Enter** key on your keyboard to begin the communication process between the target Master and your computer.
 - Initially, the Master Security option is disabled (from within the **System Security** page) and no username and password is required for access or configuration.
 - Both HTTP and HTTPS Ports are enabled by default (via the **Manage System > Server** page).
 - If the Master has been previously configured for secured communication, click **OK** to accept the AMX SSL certificate (if SSL is enabled) and then enter a valid username and password into the fields within the Login dialog.
4. Click **OK** to enter the information and proceed to the Master's Manage WebControl Connections window.
5. You can access the Manage WebControl Connections page (FIG. 28) by clicking on the **Manage connections** link (within the Web Control section within the Navigation frame). Once activated, this page displays links to G4 panels running the latest G4 Web Control feature (previously setup and activated on the panel).

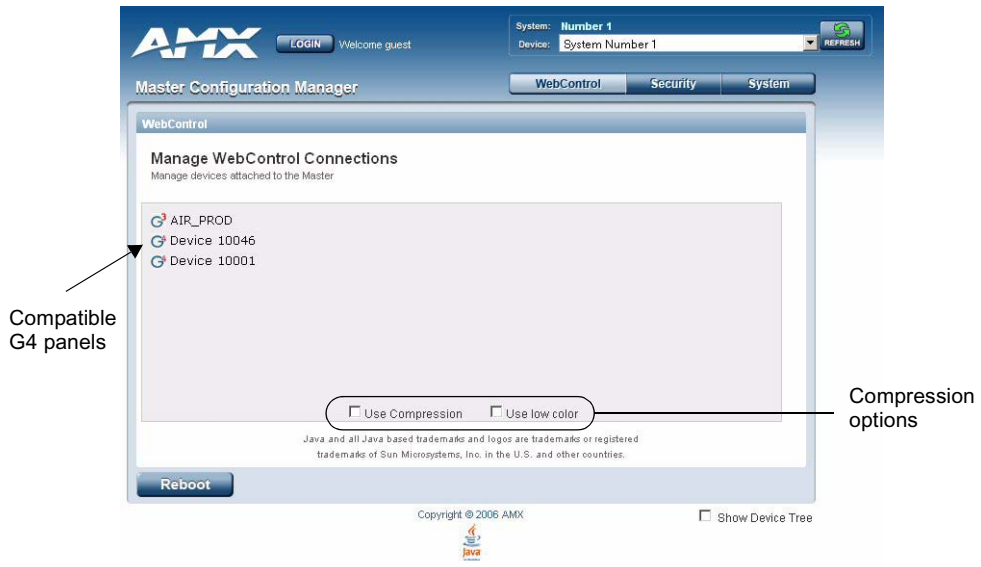


FIG. 28 Manage WebControl Connections page (populated with compatible panels)

6. Click **Yes** from the Security Alert popup window to agree to the installation of the G4 WebControl application on your computer. This application contains the necessary Active X and VNC client applications necessary to properly view and control the unit's pages from your computer.

7. Click on the G4 panel name link associated with the target panel. A secondary web browser window then appears on the screen (FIG. 29).

NOTE

The G4 Web Control application is sent by the TPI-PRO to the computer that is used for communication. Once the application is installed, this popup will no longer appear. This popup will only appear if you are connecting to the target panel using a different computer.

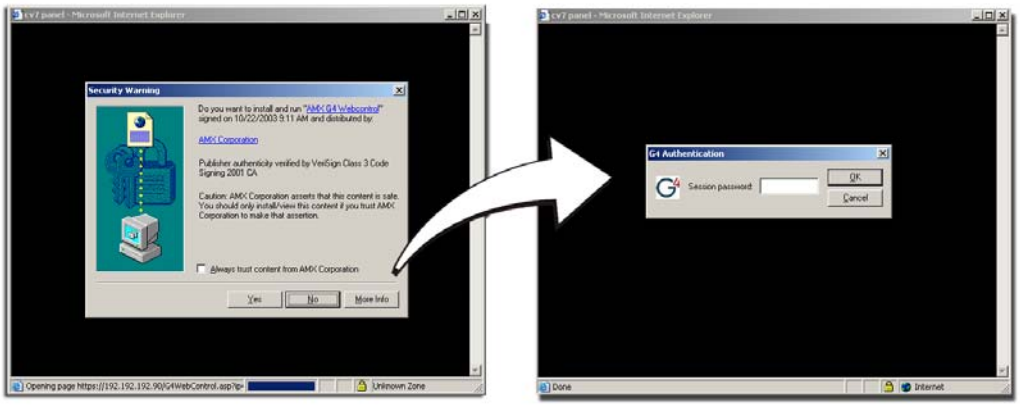


FIG. 29 Web Control VNC installation and Password entry screens

8. In some cases, you might get a Connection Details dialog box (FIG. 30) requesting a VNC Server IP address. This is not the IP address of the Master, but the IP address of the target touch panel. Depending on which method of communication you are using, you can find the IP address in the IP Address field in the **Wired Ethernet** - System Connection > IP Settings section. If you do not see this field continue to step 9.

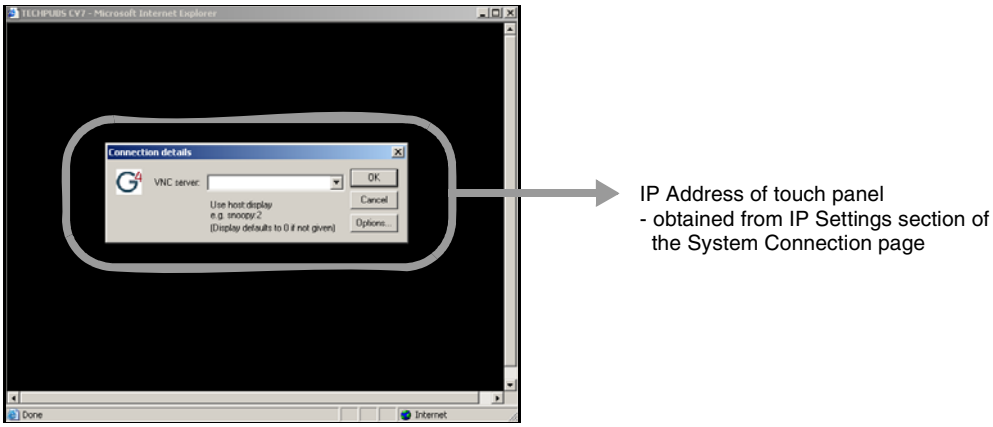


FIG. 30 Connection Details dialog

9. If you setup a WebControl password on the G4 WebControl page, a G4 Authentication Session password dialog box appears on the screen within the secondary browser window.
10. Enter the Web Control session password into the Session password field (FIG. 29). This password was previously entered into the Web Control Password field within the G4 Web Control page on the TPI-PRO.
11. Click **OK** to send the password to the TPI-PRO and begin the session. A confirmation message appears stating *"Please wait, Initial screen loading..."*

The secondary window becomes populated with the same G4 page being displayed on the target G4 panel. A small circle appears within the on-screen G4 panel page and corresponds to the location of the mouse cursor. A left-mouse click on the computer-displayed panel page equates to an actual touch on the target G4 panel page.

Upgrading TPI-PRO Firmware

Before beginning the Upgrade process:

- Setup and configure your NetLinx Master. Refer to your particular NetLinx Master instruction manual for detailed setup procedures.
- Select the correct resolution, touch drivers, and calibrate the TPI-PRO. Refer to the *Calibrating the TPI-PRO Using a USB Input* section on page 28.
- Refer to the NetLinx Studio version 2.4 or higher Help file for more information on uploading files via Ethernet.
- Configure your TPI-PRO for direct communication. Refer to the *Configuring Communication* section on page 31 for more detailed information about Ethernet communication.

The process of updating firmware involves the use of a communicating NetLinx Master. The required steps for updating firmware to a TPI-PRO are virtually identical to those necessary for updating .kit files to a NetLinx Master (except the target device is a panel instead of a Master). Refer to either your Master's literature or Studio 2.4 Help file for those procedures.



A TPI-PRO which is not using a valid username and password will not be able to communicate with a secured Master. If you are updating the firmware on a TPI-PRO which is not using a username or password field, you must first remove the Master Security feature to establish an unsecured connection.

Upgrading the TPI-PRO Firmware through an IP Address

Before beginning with this section, verify that your TPI-PRO unit is powered and connected to the NetLinx Master through either an Ethernet connection.

Step 1: Prepare the Master for communication through an IP address

1. Obtain the IP Address of the NetLinx Master from your System Administrator, if you do not have an IP address for the Master, refer to your particular Master's instruction manual for more information on obtaining an IP address using NetLinx Studio 2.4 or higher.
 - From the **Online Tree** tab of the Workspace window, select the NetLinx Master.
 - Follow steps outlined in either the *Obtaining or Assigning the Master's IP Address* sections from your NetLinx Master instruction manual to use an address.
 - Note the IP address and gateway information.
2. Launch NetLinx Studio 2 (default location is **Start > Programs > AMX Control Disc > NetLinx Studio 2 > NetLinx Studio 2**).
3. Select **Settings > Master Communication Settings** from the Main menu to open the Master Communication Settings dialog box (FIG. 31).

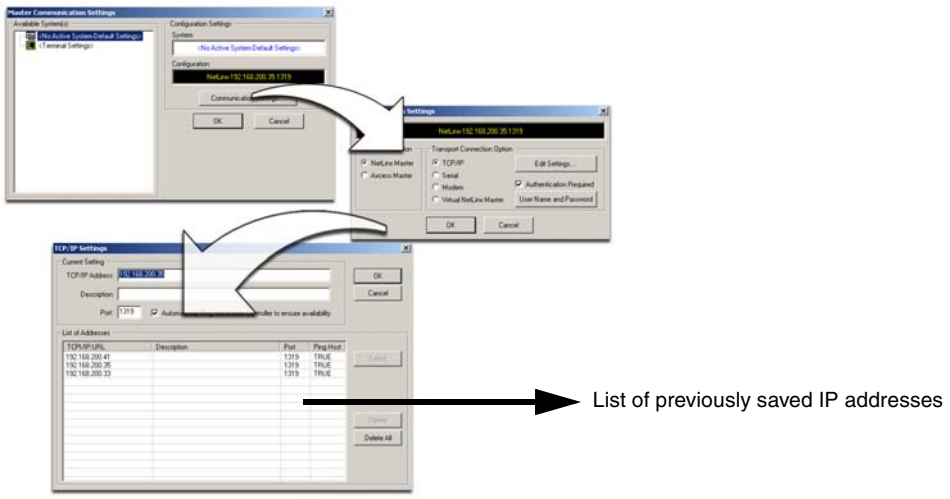


FIG. 31 Assigning Communication Settings and TCP/IP Settings

4. Click the **Communications Settings** button to open the Communications Settings dialog box.
5. Click on the **NetLinx Master** option button in the Platform Selection section to indicate that you are working with a NetLinx Master (such as the NXC-ME260/64 or NI-Series of Integrated Controllers).
6. Click on the **Authentication Required** option button if the Master is secured, then enter a username and password.
7. Click on the **TCP/IP** option button in the Transport Connection Option section to indicate you are connecting to the Master through an IP address.
8. Click the **Edit Settings** button in the Communications Settings dialog box to open the TCP/IP Settings dialog box (FIG. 31).
9. In the TCP/IP Settings dialog box, click **New** to enter the IP information for a new IP address or select from the list of previously entered IP addresses, and alter their properties by clicking **Edit** and making your changes.
10. Enter the IP address into the TCP/IP Address field. This information is obtained from either your System Administrator or obtained from the Master.
11. Click **OK** when you are done adding or editing the IP address from the New/Edit TCP/IP Setting dialog box.
12. Click **OK** three more times to close the open dialog boxes and save your settings.
13. Click **Yes** to interrupt the current communication from the Master and apply the new settings.
14. Select **Tools > Reboot the Master Controller** to access the Reboot the Master dialog box, then click **Reboot** to reboot the Master and incorporate any changes.
15. When the dialog box replies with *"Reboot of system complete"*, press **Done**.
16. Click the **OnLine Tree** tab in the Workspace window to view the devices on the System. The default System value is one.
17. Right-click the **Empty Device Tree/System** entry, and select **Refresh System** to re-populate the list.

Step 2: Prepare the TPI-PRO for communication via an IP address

1. Press the **Mode** field until the choice cycles to URL. By selecting **URL**, the System Number field becomes read-only (grey) because the panel pulls this value directly from the communicating target Master (virtual or not). A virtual Master system value can be set within the active AMX software applications such as: NetLinx Studio, TPD4, or IREdit.
2. Press the blue **Master IP/URL** field to open a Keyboard and enter the NetLinx Master's IP Address (obtained from the Diagnostics - Networking Address dialog box of the NetLinx Studio application).
3. Click **Done** to accept the new value and return to the System Configuration page.
4. Do not alter the Master Port Number value. This is the default value used by NetLinx.
5. Press the on-screen **Reboot** button, on the Protected Setup page, to restart the TPI-PRO and save any changes.

Step 3: Verify and Upgrade the TPI-PRO firmware via an IP address

1. Click the **OnLine Tree** tab in the Workspace window to view the devices on the System. *The default System value is one.*
2. Right-click the associated System number on the Workspace window, and select **Refresh System** to detect all devices on the current system, establish a new connection to the Master, and refresh the System list with devices on the system.
3. After the Communication Verification dialog box verifies active communication between the PC and the Master, verify the panel appears in the OnLine Tree tab of the Workspace window (FIG. 32). The default TPI-PRO panel value is 10001.

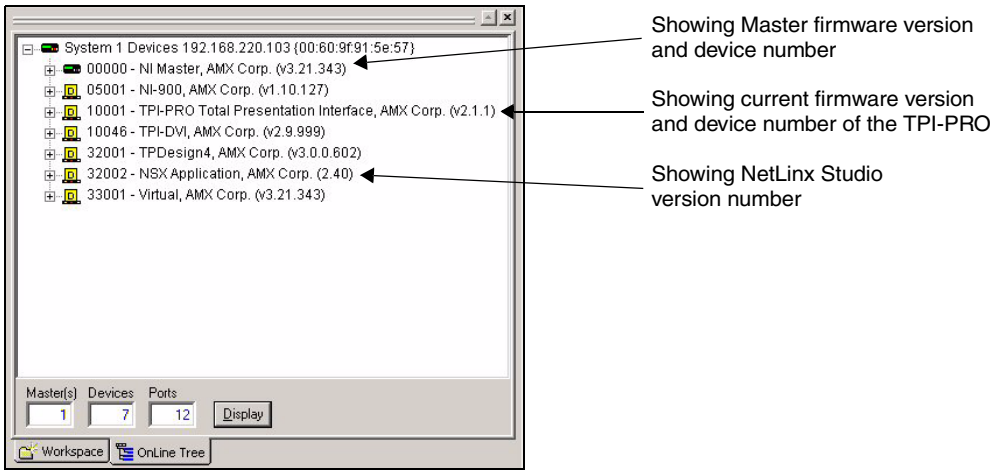


FIG. 32 NetLinx Workspace window (showing connected TPI-PRO)

NOTE

The TPI-PRO firmware is shown on the right of the listed unit.

4. If the firmware version is not the latest available, locate the latest firmware file from the **www.amx.com > Tech Center > Download Updates > Firmware Files > TPI-PRO** section of the website.
5. Download the appropriate .kit file to your computer.
6. Verify you have downloaded the latest TPI-PRO firmware (.kit) file to a known location.

7. Select **Tools > Firmware Transfers > Send to NetLinx Device** from the Main menu to open the Send to NetLinx Device dialog box (FIG. 33). Verify the TPI-PRO's System and Device number values match those values listed within the System folder in the **OnLine Tree** tab of the Workspace window.

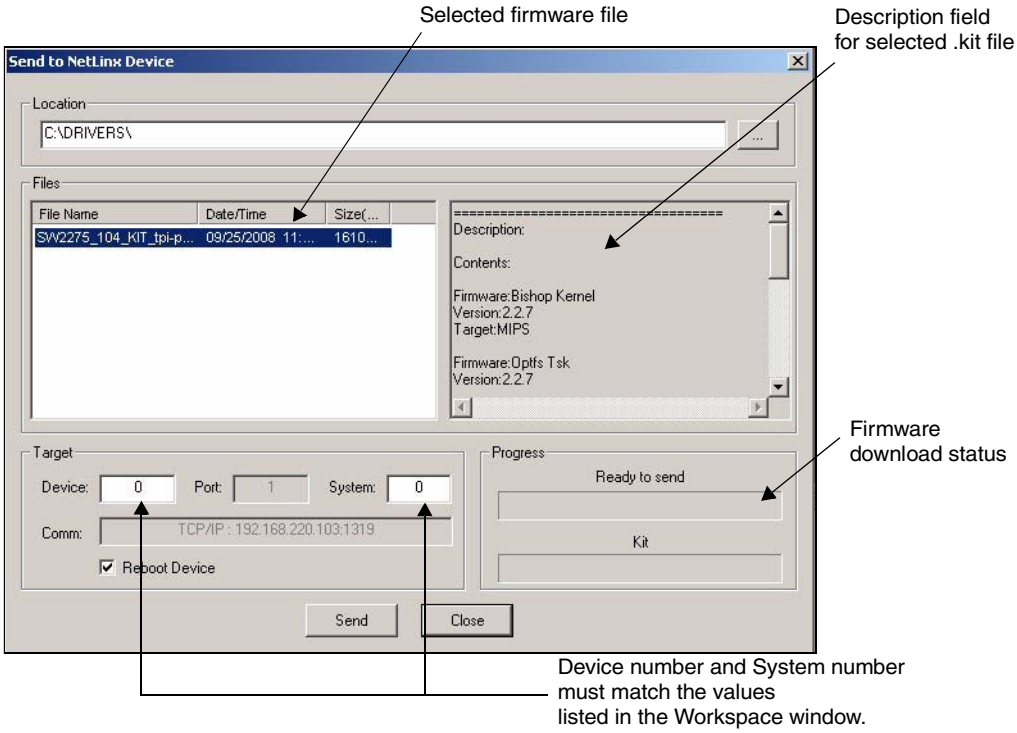


FIG. 33 Select to NetLinx Device dialog box (showing TPI-PRO firmware update via IP)

8. Select the TPI-PRO's .kit file from the Files section (FIG. 33).
9. Enter the **Device** value associated with the TPI-PRO and the **System** number associated with the Master (*listed in the OnLine Tree tab of the Workspace window*). The Port field is greyed-out.
10. Click the **Reboot Device** checkbox. This causes the TPI-PRO to reboot after the firmware update process is complete. *The reboot of the unit can take up 30 seconds after the firmware process has finished.*
11. Click **Send** to begin the transfer. The file transfer progress is indicated on the bottom-right of the dialog box (FIG. 33).
12. Click **Close** after the unit reboots to return to the main program.
13. Right-click the associated System number, and select **Refresh System**. All project systems refresh, a new connection to the Master is established, and the System list populates with devices on your system.

Firmware Pages and Descriptions

This section describes each G4 firmware page and their specific functional elements. The TPI-PRO is a G4 device that utilizes specific G4 pages.

Setup Navigation Buttons

The G4 Setup Navigation Buttons (FIG. 34) appear on the left of the panel screen when the Setup page is currently active.



FIG. 34 G4 Setup Navigation Buttons

These Navigation Buttons are specific to the TPI-PRO and include the device specific elements described in the following table:

G4 Setup Navigation Button Elements	
Protected Setup	Press the Protected Setup button to access the Protected Setup page section that provides access to the TPI-PRO's Web Control, calibration features, and connection settings. • Refer to the *Protected Setup Page* section on page 59 for more detailed information.
Information	Press the Panel Information button to access the Panel Information page and view device specific information such as resolution, memory, etc. ***(read-only)***. • Refer to the *Panel Information Page* section on page 51 for more detailed information.
Time	Press the Time Adjustment button to access the Time Adjustment page where you can alter the time and date settings on the Master. • Refer to the *Time & Date Setting Page* section on page 52 for more detailed information.
Audio	Press the Audio Adjustment button to access the Volume page where you can alter the audio parameters on the TPI-PRO. • Refer to the *Audio Settings* section on page 53 for more detailed information.

G4 Setup Navigation Button Elements (Cont.)	
Video	Press the Video Adjustment button to access the main video page where you can set the video properties for incoming signal. • The displayed page is associated to the HD-15 port being used. • The TPI-PRO-4 can use any combination of up to four (4) source inputs. The TPI-PRO-2 can use any combination of up to two (2) source inputs. • Refer to the *Video Settings Page* section on page 54 for more detailed information.

Setup Page

The page (FIG. 35) centers around the basic properties used by the touch device connected to the TPI-Pro such as: Connection Status of the TPI-PRO, Display Timeout, Inactivity Page Flip Time, and Inactivity page file information for the TPI-PRO device.

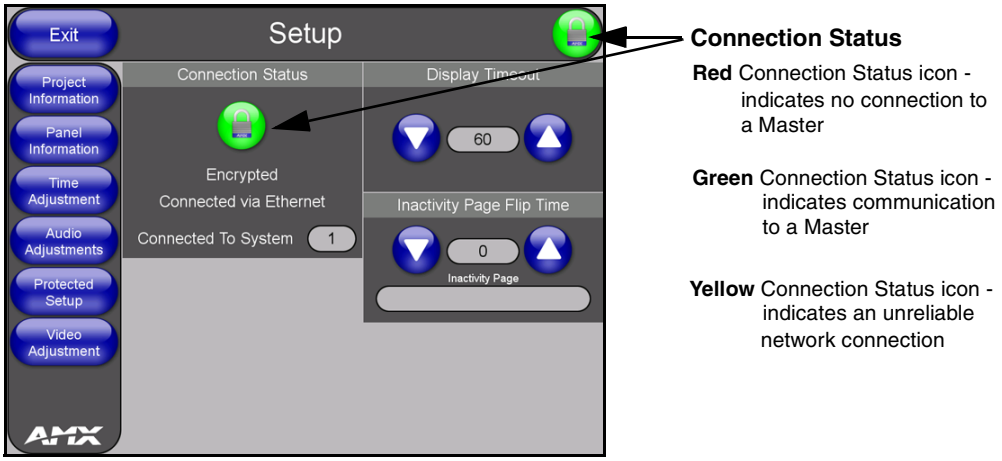


FIG. 35 Setup page

The elements of the Setup page are described in the table below:

Setup Page Elements	
Exit	Returns you to the Main touch panel page. In this case, the previous page is the default Main page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).

Setup Page Elements (Cont.)	
Connection Status	Displays whether the G4 device is communicating externally, the encryption status of the communicating Master, what connection type is being used (*Ethernet*), and of which System the unit is a part. This visual display of the connection status is also reflected at the upper-right of each firmware page. This allows the user to have a current visual update of the panel's connection status regardless of what page is currently active. • The message displayed is '*Connected via Ethernet*'. • If no connection can be established by the TPI-PRO, it will continue to try and establish a connection while displaying: "*Attempting via*". • The word "*Encrypted*" appears only when an encrypted connection is established with a target Master. • The G4 device must be rebooted before incorporating any panel communication changes and detecting any active Ethernet connections. ***The Ethernet connection is not detected until after a reboot.***
Display/Panel Timeout	Sets the length of time the TPI-PRO can remain idle before activating the sleep mode. When the device goes into sleep mode, the LCD is powered-down. • Press the UP/DN buttons to increase/decrease the time until the TPI-PRO times out. Range = 0 - 240 minutes. • Use this button to set the timeout value to zero and disable the sleep mode.
Inactivity Page Flip Timeout	Sets the number of minutes of inactivity before the G4 device automatically flips to a pre-selected touch panel page. When the device goes into this inactivity mode, the LCD does not power-down. • Press the UP/DN buttons to increase/decrease the time the panel can remain inactive before it flips to the preset page. Range = 0 - 240 minutes. • Use this button to set the timeout value to zero and disable the inactivity page flip mode. • The touch panel page used for the Inactivity page flip is shown within a small Inactivity Page field.

Project Information Page

The Project Information page displays the TPDesign4 (TPD4) project file properties currently loaded on the selected TPI-PRO (FIG. 36). Refer to the *TPDesign4 Touch Panel Program* instruction manual for more specific information on uploading TPDesign4 files to a panel.

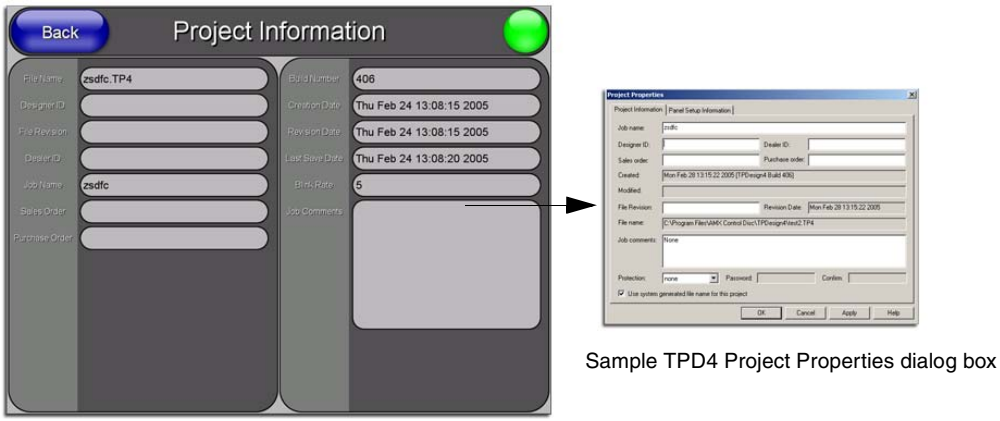


FIG. 36 Project Information page

The elements of the Project Information page are described in the table below:

Project Information Page Elements	
Back	Returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
File Name	Displays the name of the TPDesign4 project file downloaded to the TPI-PRO.
Designer ID	Displays the designer information.
File Revision	Displays the revision number of the file.
Dealer ID	Displays the dealer ID number (*unique to every dealer and entered in TPD4*).
Job Name	Displays the job name.
Sales Order	Displays the sales order information.
Purchase Order	Displays the purchase order information.
Build Number	Displays the build number information of the TPD4 software used to create the project file.
Creation Date	Displays the project creation date.
Revision Date	Displays the last revision date for the project.
Last Save Date	Displays the last date the project was saved.
Blink Rate	Displays the feedback blink rate (10th of second).
Job Comments	Displays any comments associated to the job. These comments are taken from the TPD4 project file.

Panel Information Page

The Panel Information page (FIG. 37) centers around TPI-PRO properties such as resolution used, on-board memory, firmware, address/channel information, and string information.

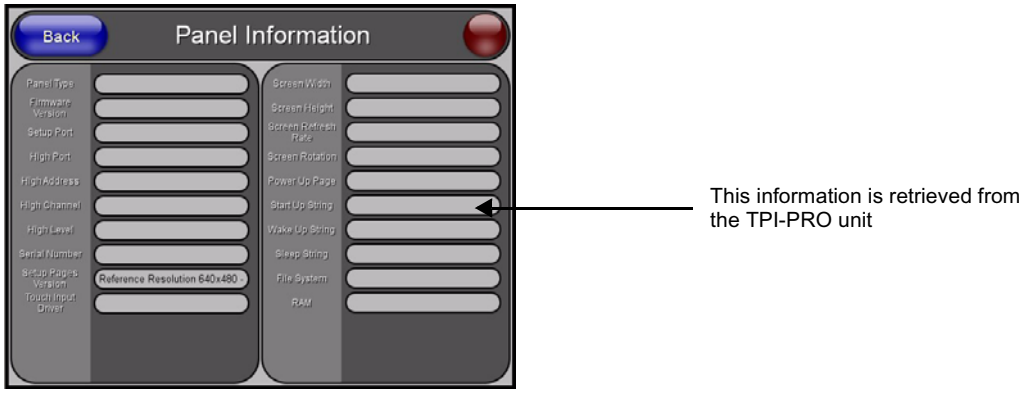


FIG. 37 Panel Information page (takes its information from the TPI-PRO device)

The elements of the Panel Information page are described in the table below:

Panel Information Page Elements	
Back	Returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
Panel Type	Displays the type of G4 device being used.
Firmware Version	Displays the G4 firmware version being used by the G4 device. • Verify you have the latest version from **www.amx.com**.
Setup Port	Displays the setup port information/value being used by the TPI-PRO.
High Port	Displays the high port (port count) value for the TPI-PRO.
High Address	Displays the high address (address count) value for the TPI-PRO.
High Channel	Displays the high channel (channel count) value for the TPI-PRO.
High Level	Displays the high level (level count) value being used by the TPI-PRO.
Serial Number	Displays the specific serial number value assigned to the TPI-PRO.
Setup Pages Version	Displays the type and version of the Setup pages being used by the TPI-PRO.
Touch Input Driver	Displays the driver used for the touch panel.
Screen Width	Displays the pixel width being used to display the incoming video signal on the G4 device. • Maximum available screen width on a TPI-PRO is 1920 pixels.
Screen Height	Displays the pixel height being used to display the incoming video signal on the G4 device. • Maximum available screen height on a TPI-PRO is 1200 pixels.
Screen Refresh Rate	Displays the video refresh rate applied to the incoming video signal from the G4 device.
Screen Rotation	Displays the degree of rotation applied to the on-screen image.

Panel Information Page Elements (Cont.)	
Power Up Page	Displays the first touch panel page assigned for display after the device is powered-up. • This information is taken from the TPD4 project file. • Most projects begin with a Main page.
Start Up String	Displays the start-up string.
Wake Up String	Displays the wake up string used after an activation from a timeout.
Sleep String	Displays the sleep string used during the device's sleep mode.
File System	Displays the amount of Compact Flash memory available on the TPI-PRO.
RAM	Displays the available RAM (or Extended Memory module) on the TPI-PRO.

Time & Date Setting Page

The Time & Date Settings page (FIG. 38) allows you to alter or set the time and date information on the NetLinx Master. If either the time or date is modified on this page and then updated to the Master by pressing the Set Time button, all devices communicating to that target Master are updated to reflect the new information.

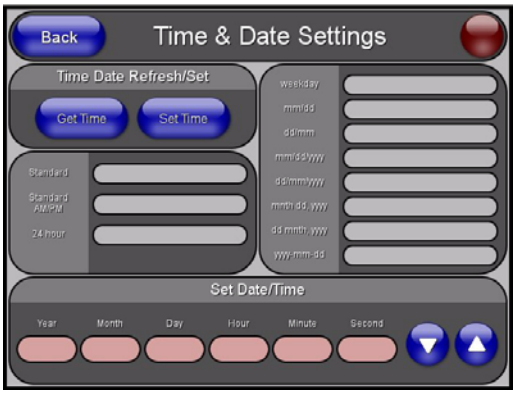


FIG. 38 Time and Date Settings page (takes its information from the TPI-PRO device)

NOTE

The only way to modify a TPI-PRO's time, without altering the Master, is to use NetLinx Code.

The elements of the Time & Date Setup page are described in the table below:

Time & Date Settings Page Elements	
Back	Returns you to the previously active touch panel page without saving changes. (To save changes, use the Set Time button.)
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
Time Date Refresh/Set	This section provides you with two options: • The **Get Time/Date** button retrieves the Time and Date information from the Master. • The **Set Time/Date** button sets the Master to retain and save any time or date modifications made on the Time and Date Setup page.

Time & Date Setup Page Elements (Cont.)	
Time Display fields	These fields display the time in three formats: STANDARD, STANDARD AM/PM, and 24 HOUR.
Date Display fields	These fields display the calendar date information in several different formats.
Set Date/Time	This section provides a user with both UP/DN arrow buttons to alter the Master's calendar date and time. The blue circle indicates which field is currently selected. • Select the **Year** field and use the UP/DN buttons to alter the year value (range = 2000 - 2037). • Select the **Month** field and use the UP/DN buttons to alter the month value (range = 1 - 12). • Select the **Day** field and use the UP/DN buttons to alter the day value (range = 1 - 31). • Select the **Hour** field and use the UP/DN buttons to alter the hour value (24-hour military). • Select the **Minute** field and use the UP/DN buttons to alter the minute value (range = 0 - 59). • Select the **Second** field and use the UP/DN buttons to alter the second value (range = 0 - 59).

NOTE

The TPI-PRO does not have an on-board clock. This page both receives and sets the time/date of the NetLinx Master.

Audio Settings

The Audio Settings page (FIG. 39) (accessed by pressing the Audio button on the Setup page) allows you to adjust the master volume parameters and default panel sounds on the TPI-PRO.



FIG. 39 Volume configuration page

The elements of the Audio Settings page are described in the table below:

Audio Settings Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).

Audio Settings Page Elements (Cont.)	
Master Volume	This section allows you to adjust the current sound level on the unit's internal speaker: • Use the UP/DN buttons to adjust the volume output on the internal speakers (range = 0 - 100). • The Internal Sound Level bargraph indicates the current sound level. • The **Mute** button mutes the volume. • The **Play Test** button plays a test WAV/MP3 file over the internal speakers.
Default Panel Sounds	Sets the unit to play either the default **Button Hit** sound (when you touch an active button) and/or the default **Button Miss** sound (when you touch a non-active button or any area outside of the active button).

Supported sampling rates for WAV

The following is a listing of supported sampling rates associated for WAV files played on this G4 unit. Some WAV files currently played on other devices may not work on this unit. The supported sampling rates for WAV files are:

Supported WAV Sampling Rates	
• 48000 Hz	• 16000 Hz
• 44100 Hz	• 12000 Hz
• 32000 Hz	• 11025 Hz
• 24000 Hz	• 8000 Hz
• 22050 Hz	

Protected Setup Page

This button opens the Protected Setup page which centers around the properties used by the panel to properly communicate with the NetLinx Master. Refer to the *Protected Setup Navigation Buttons* section on page 58 for more detailed information.

Video Settings Page

The Video Settings page (FIG. 40) sets the Video properties of the incoming video signal. You can access this page by pressing the Video button on the Setup page. This page contains four tabs across the top for each source input on the unit. If you are using a TPI-PRO-2, slots 3 and 4 appear greyed out. These source inputs are labeled at the rear of the unit. For each source input, you must manually set the Input type. The TPI-PRO does not detect the type of connection for you. You can choose from Composite, S-Video, Computer (VGA), and Component (YPrPb).

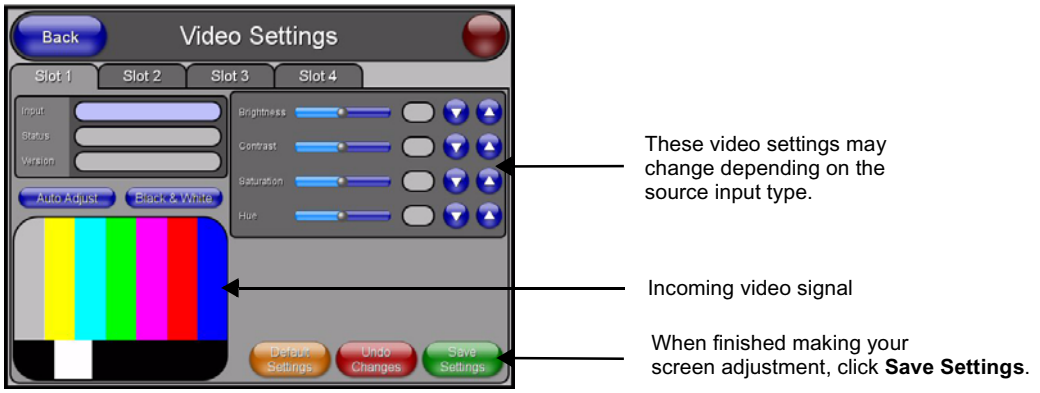


FIG. 40 Video Adjustment page (showing default values)

The elements of the Video Settings page are described in the table below:

Video Settings Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
Input	Allows you to cycle through a choice of available video inputs (Composite 1, Composite 2, Composite 3, S-Video, Computer (VGA), and Component (YPrPb)). Default = Composite 1
Status	Displays whether a video-sync signal is detected.
Version	Displays the firmware version currently used by the TPI-PRO.
Auto Adjust	The **Auto Adjust** button toggles between auto detection and manual setup. It is only valid on VGA and Component Input signals.. Default = Auto
Black & White	The **Black & White** button toggles the Black & White display mode. It is only valid on Composite and S-Video inputs. Default = Off
Brightness	Use the UP/DN buttons to alter the brightness level of the incoming signal. This option does not appear if you select Computer (VGA) as the input type or progressive scan component input signals. • Range = 0 - 255, default = 128
Contrast	Use the UP/DN buttons to alter the contrast level of the incoming signal. This option does not appear if you select Computer (VGA) as the input type or progressive scan component input signals. • Range = 0 - 255, default = 128
Saturation	Use the UP/DN buttons to alter the color saturation level of the incoming signal. This option does not appear if you select Computer (VGA) as the input type or progressive scan component input signals. • Range = 0 - 255, default = 128
Hue	Use the UP/DN buttons to alter the hue level of the incoming signal. This option does not appear if you select Computer (VGA) as the input type or progressive scan component input signals. • Range = 0 - 255, default = 128
Phase	Use the UP/DN buttons to alter the phase level of the incoming signal. This option only appears if you select Computer (VGA) or Component (YPrPb) as the input type. • Range = 0 - 255, default = 128
H Position	Use the UP/DN buttons to alter the horizontal position of the incoming signal. This option only appears if you select Computer (VGA) or Component (YPrPb) as the input type. Range = 0 - 255, default = 128
H Size	Use the UP/DN buttons to alter the horizontal size of the incoming signal. This option only appears if you select Computer (VGA) or Component (YPrPb) as the input type. Range = 0 - 255, default = 128
V Position	Use the UP/DN buttons to alter the vertical position of the incoming signal. This option only appears if you select Computer (VGA) or Component (YPrPb) as the input type. Range = 0 - 255, default = 128
Default Settings	The **Default Settings** button sets the video settings to their default values (indicated in this table).

Video Settings Page Elements (Cont.)	
Undo Changes	The **Undo Changes** button disregards any changes made on the page since the last settings were saved.
Save Settings	The **Save Settings** button saves any changes made to this page.

Video Settings - RGB Adjustment Page

The RGB Adjustment page (FIG. 41) sets the RGB properties of the incoming signal. You can access this page by pressing the incoming signal area on the Video Adjustment page as long as an RGB signal is currently displaying.

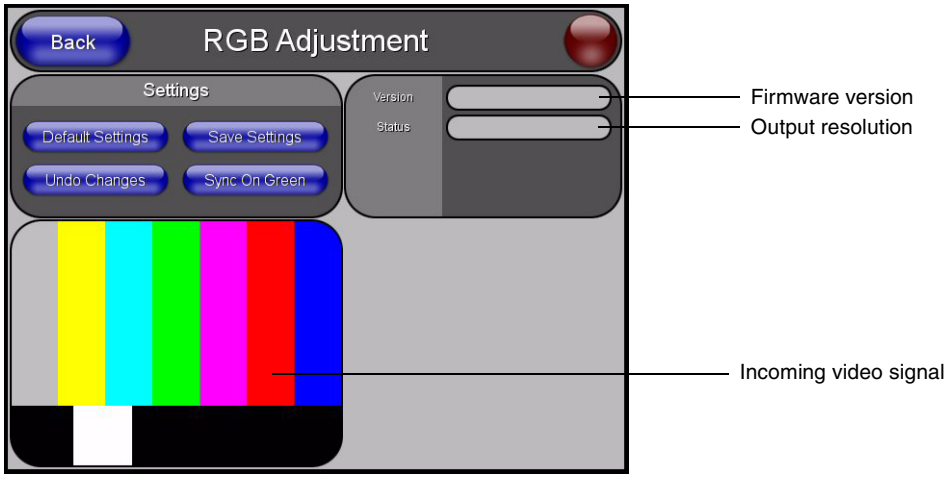


FIG. 41 RGB Adjustment page

The elements of the RGB Adjustment page are described in the table below:

RGB Adjustment Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
Default Settings	The **Default Settings** button sets the video settings to their default values (indicated in this table).
Undo Changes	The **Undo Changes** button disregards any changes made on the page since the last settings were saved.
Save Settings	The **Save Settings** button saves any changes made to this page.
Sync on Green	The **Sync on Green** button sets the source port to search for the signal on Green signal.
Version	Displays the firmware version currently used by the TPI-PRO.
Status	Displays whether a video-sync signal is detected.

Adjusting the Incoming Image on the Video Adjustment Page

After opening the Video Adjustment page, you can select any of the available source inputs by selecting the corresponding tab at the top of the screen. If the selected source input is receiving an image, this image is displayed in the incoming signal area. You can adjust the incoming image by using the video setting on the right side of the screen.

Perform the following steps to adjust these settings:

1. Press the appropriate Slot tab on the Video Adjustments page.



One of the first things to look at when trying to adjust your RGB image, is the Phase value. Adjustments to this value can help troubleshoot most image issues.

2. Press the Input button to select the source input type for this slot. If you select Computer (VGA) or Component (YPrPb) as the input type, proceed to step 3. Otherwise, skip to step 7.



The incoming TPI-PRO image must be first be adjusted (especially if using a CRT monitor) to fit into the visible screen area. Refer to the TPI-PRO and Panel Interface Setup section on page 25 *for more detailed information on adjusting the position and size on a CRT monitor. When using a touch panel, the TOUCH DRIVER selected should compensate for the visible area, if not, continue with these steps.*

3. Use the UP/DN **Phase** buttons to alter the RGB tracking/signal level of the incoming image/video. These values cycle back thru 0 and on after reaching 31.
4. Use the UP/DN **H Position** buttons to adjust the horizontal location and move the image (left-right) on the screen. These values cycle back thru 0 and on after reaching 255.
5. Use the UP/DN **H Size** buttons to adjust the horizontal height and stretch the image on the screen. These values cycle back thru 0 and on after reaching 255.
6. Use the UP/DN **V Position** buttons to adjust the vertical location and move the image (up-down) on the screen. These values cycle back thru 0 and on after reaching 255. If you selected Computer (VGA) in step 2, skip to step 11.
7. Use the UP/DN **Brightness** buttons to adjust either the overall or individual Red, Green, and Blue brightness of the incoming image/video.
8. Use the UP/DN **Contrast** buttons to adjust the overall or individual Red, Green, and Blue contrast of the incoming image/video. Increasing the value can increase the sharpness of the image.
9. Use the UP/DN **Saturation** buttons to adjust the overall or individual Red, Green, and Blue saturation of the incoming image/video. Increasing the value can increase the brightness of the colors in the image.
10. Use the UP/DN **Hue** buttons to adjust the overall or individual Red, Green, and Blue hue of the incoming image/video.
11. Press the **Save Settings** button to save your changes for the source input. Cycling power to the panel before saving your settings can cause your pages to shift back to their original locations.
12. Press the **Back** button to return to the Setup page.

Protected Setup Navigation Buttons

The Protected Setup Navigation Buttons (FIG. 42) appear on the left of the screen when the Protected Setup page is currently active.



FIG. 42 G4 Protected Setup Navigation Buttons

These Navigation Buttons are specific to the TPI-PRO device and include the device specific elements described in the following table:

G4 Protected Setup Navigation Button Elements	
System Settings	Press the System Connection button to access the System Settings page where you can alter the communication parameters of both the NetLinx Master and TPI-PRO. • Refer to the *System Settings Page* section on page 64 for more detailed information.
Calibrate	Press the Calibrate button to access the Calibration page where you can use the displayed set of crosshairs to calibrate a touch screen/panel. • Refer to the *Calibration Page* section on page 63 for more detailed information.
G4 Web Control	Press the G4 Web Control button to access the G4 Web Control page where you can enable or disable display and control of your panel (via the web) by a PC running a VNC client. • Refer to the *Using G4 Web Control® to Interact with a G4 Panel* section on page 38 for more detailed information.
Other Settings	Press the Other Settings button to open a slide bar with the following options: • Press the Cache button to open the Cache page where you can adjust your Flash Cache settings. Refer to the for more detailed information. • Press the Passwords button to access the Password Setup page where you can specify up to five security passwords The default password is 1988. Refer to the *Password Setup Page* section on page 63 for more detailed information.
Tools	Press the Tools button to open a slide bar with the following options: • Press the Panel Logs button to open the Panel Logs page where you can view your panel's connection history. Refer to the *Panel Logs Page* section on page 68 for more detailed information. • Press the Panel Statistics button to open the Panel Statistics page where you can view the connection statistics for your panel. Refer to the *Panel Statistics Page* section on page 70 for more detailed information. • Press the Connection Utility button to open the Connection Utility page where you can view connection statistics and information for your panel. Refer to the *Connection Utility Page* section on page 72 for more information.

Protected Setup Page

The Protected Setup page (FIG. 43) centers around the properties used by the TPI-PRO to communicate with the NetLinx Master. Enter the factory default password (***1988)*** into the password keypad to access this page.

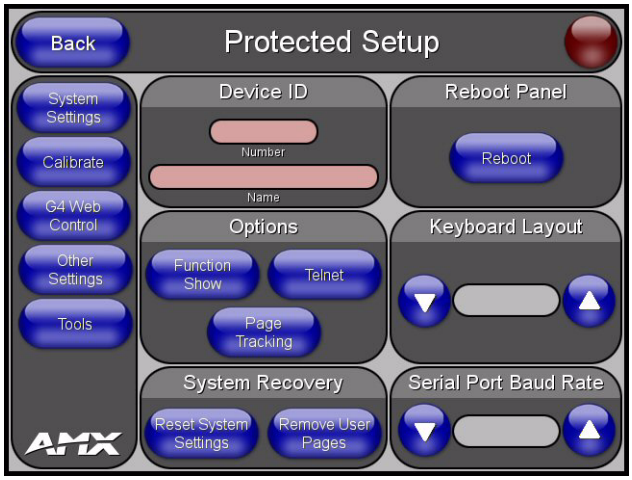


FIG. 43 Protected Setup page

The elements of the Protected Setup page are described in the table below:

Protected Setup Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
Device Number	Opens a keypad that is used to set and display the current device number.
Options	Allows you to select various TPI-PRO features: • The **Function Show** button enables the display of the channel port and channel code in the top left corner of the button, the level port and level code in the bottom left corner, and the address port and address code in the bottom right corner (see FIG. 45 for an example of the function locations). • Use the **Page Tracking** button to toggle page tracking. When enabled, the TPI-PRO sends page data back to the NetLinx Master, or vice versa depending on the touch panel settings. • Use the **Telnet** button to enable or disable the telnet server on the TPI-PRO. This feature focuses on direct telnet communication to the TPI-PRO.

Protected Setup Page Elements (Cont.)	
System Recovery	Allows you to either reset the TPI-PRO to factory default settings and/or wipe out all existing touch panel pages: • The **Reset System Settings** button allows a user to wipe out all current configuration parameters on the TPI-PRO (such as IP Addresses, Device Number assignments, Passwords, and other presets). - Pressing this button launches a confirmation dialog box (FIG. 44) which asks you to confirm your selection. - This dialog box is configured with a delay timer that does not enable the YES button for 5 seconds. This delay provides an additional amount of time for the user to confirm his decision. • The **Remove User Pages** button allows you remove all current TPD4 touch panel pages currently on the TPI-PRO (*including the pre-installed AMX Demo pages*). - Pressing this button launches a Confirmation dialog box (FIG. 44) which asks you to confirm your selection. - This dialog box is configured with a delay timer that does not enable the YES button for 5 seconds. This delay provides an additional amount of time for the user to confirm their decision.
Reboot	Pressing this on-screen button causes the TPI-PRO to restart after saving any changes.
Keyboard Layout	Use the Keyboard Layout UP/DN buttons to select the type of keyboard you want to use.
Serial Port Baud Rate	Use the Baud Rate UP/DN buttons to alter the baud rate for the front serial port. The range is from 1200 - 115200. • Default is 38400.

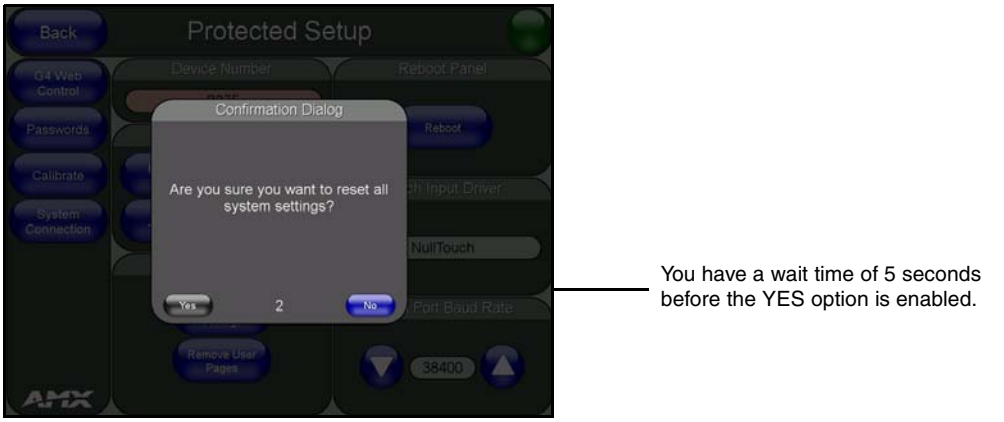


FIG. 44 Protected Setup page-System Recovery confirmation dialog box

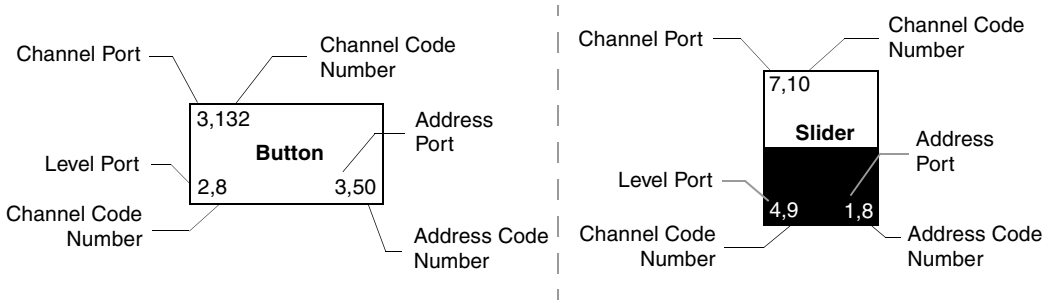


FIG. 45 Button/slider Function Show example

G4 Web Control Page

The G4 Web Control page (FIG. 46) centers around enabling and disabling both the display and control of your TPI-PRO (via the web). An external PC running a VNC client (*installed during the initial communication to the G4 device*) makes this possible.

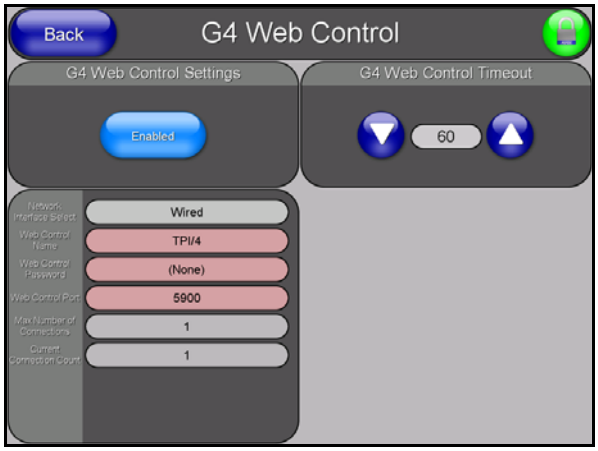


FIG. 46 G4 Web Control page

Each G4 device supports the open standard Virtual Network Computing (VNC) interface. This device contains a VNC server which allows it to accept a connection from any other device running a VNC client. Once a connection is established to that target device, the client can control the TPI-PRO remotely. The elements of the G4 Web Control page are described in the table below:

G4 Web Control Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).

G4 Web Control Page Elements (Cont.)	
G4 Web Control Settings	Sets the IP communication values for the TPI-PRO and contains:
Enable/Enabled	• The Enable/Enabled button allows you to toggle between the two G4 activation settings: - **Enable** - deactivates the G4 Web Control feature on the TPI-PRO. - **Enabled** - activates the G4 Web Control feature on the TPI-PRO and allows an external PC running a VNC client to access the unit, after the remaining fields are configured.
Network Interface Select	A read-only field that displays the method of communication to web. • **Wired** is selected because it is the only method of communication to the web (via a direct Ethernet connection). This is a default setting since no wireless interface is available.
Web Control Name	The unique alpha-numeric string that is used as the display name of the TPI-PRO within the Web Control tab of the new NetLinx Security browser window. You set the name through the Device Name field on the Protected Setup Page. This Web Control tab displays a G4 icon alongside the link to the Web Control Name given to this TPI-PRO.
Web Control Password	Allows you to enter the G4 Authentication session password associated for VNC web access of this TPI-PRO.
Web Control Port	Allows you to enter the port value that the VNC Web Server runs on. Default value is 5900.
Max Number of Connections	This field displays the maximum number of users that can be simultaneously connected to the target TPI-PRO via the web. You can set up to 4 connections. Default value is 1.
Current Connection Count	This read-only field displays the current number of users connected to the target TPI-PRO via the web. This value cannot exceed the Maximum number field.
G4 Web Control Timeout	Sets the length of time (in minutes) the TPI-PRO can remain idle (no cursor movements) before the session is closed and the user is disconnected. • Minimum value = 0 minutes (panel never times-out) • Maximum value = 240 minutes (panel times-out after 240 minutes/4hours)

Refer to the *Using G4 Web Control® to Interact with a G4 Panel* section on page 38 for more detailed instructions on how to use the G4 Web Control page with the new web-based NetLinx Security application.

Password Setup Page

The Password Setup page (FIG. 47) centers around the properties used to assign passwords for the panel pages.

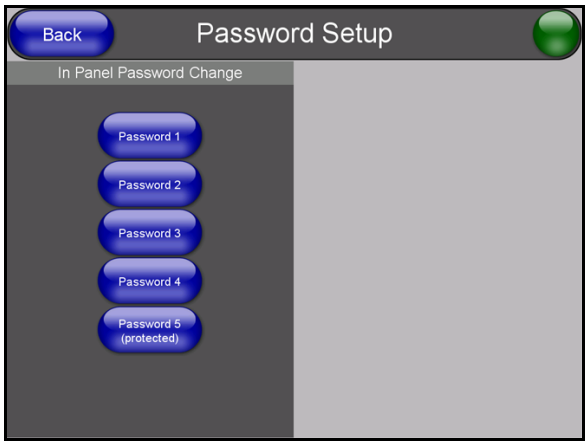


FIG. 47 Password Setup page

The elements of the Password Setup page are described in the table below:

Password Setup Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
In Panel Password Change	Accesses the alphanumeric values associated to particular password sets. • PASSWORD 1, 2, 3, 4, 5 (protected) buttons open a keyboard where you can enter alphanumeric values associated to a selected password group. • Clearing Password #5 removes the need to enter a password before accessing the Protected Setup page.

Calibration Page

This page (FIG. 48) allows you to calibrate the input touch device (touch panel) using the pre-selected touch driver.

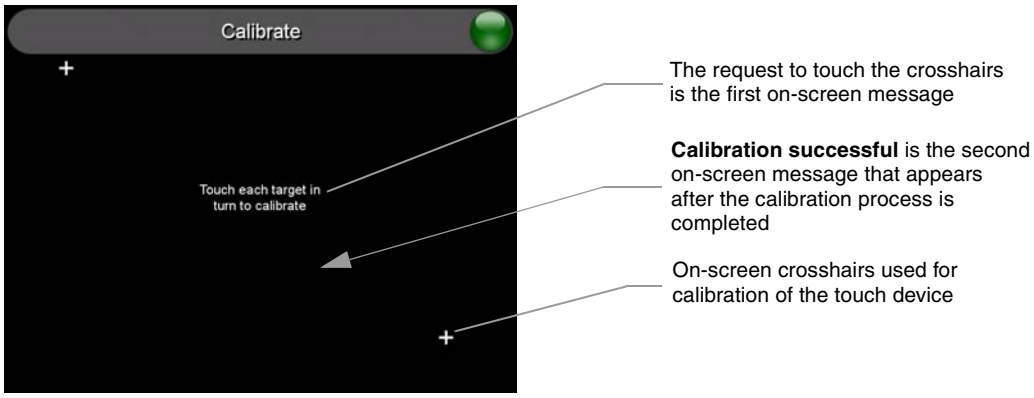


FIG. 48 Calibration page (actually 3 separate screens)

- Press and hold the front panel CALIBRATE button to access the Calibration page.
- Press the crosshairs to calibrate the panel and return to the last open firmware page.

System Settings Page

The System Settings page (FIG. 49) sets the DNS Address information with its corresponding IP communication parameters, NetLinx Master communication settings, and reads the device number assigned to the G4 device.

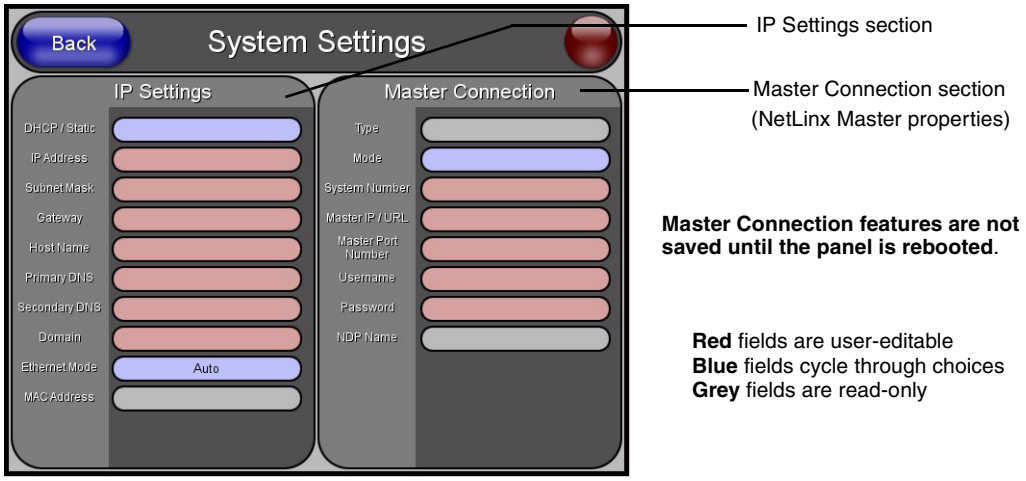


FIG. 49 System Connection page (showing default values)

The elements of the System Settings page are described in the table below:

System Settings Page Elements	
Back	Saves the changes and returns you to the previously active touch panel page.
Connection Status icon	This visual display of the connection status allows the user to have a current update of the TPI-PRO's connection status regardless of what page is currently active. • A Lock only appears on the icon if the TPI-PRO has established a connection with a currently secured target Master (*requiring a username and password*).
IP Settings	Sets the IP communication values for the TPI-PRO and contains:
DHCP/Static	Sets the G4 device to either DHCP or Static communication modes. • *DHCP (Dynamic Host Configuration Protocol)* assigns IP Addresses from client stations logging onto a TCP/IP network via a DHCP server. • *Static IP* is a permanent IP Address that is assigned to a node in a TCP/IP network.
IP Address	Sets the IP Address assigned to the TPI-PRO.
Subnet Mask	Sets a subnetwork address to the TPI-PRO. • *Subnetwork mask* is the technique used by the IP protocol to filter messages into a particular network segment (Subnet).
Gateway	Sets a gateway value to the TPI-PRO. • *Gateway* is a computer that either performs protocol conversion between different types of networks/applications or acts as a go-between two or more networks that use the same protocols.
Host Name	Sets the host name of the TPI-PRO.

System Settings Page Elements (Cont.)	
IP Settings (Cont.)	
Primary DNS	Sets the address of the primary DNS server being used by the TPI-PRO for host name lookups. • *DNS (Domain Name System)* is software that lets users locate computers on a local network or the Internet (TCP/IP network) by host and domain. The DNS server maintains a database of host names for its' domain and their corresponding IP Addresses.
Secondary DNS	Sets the secondary DNS value to the TPI-PRO.
Domain	Sets the unique name on the Internet to the TPI-PRO for DNS look-up. • The TPI-PRO belongs to the DNS domain.
Ethernet Mode	Sets the speed of the Ethernet connection to the TPI-PRO. • Choices are: **Auto**, **10 Half Duplex**, **10 Full Duplex**, **100 Half Duplex**, or **100 Full Duplex**.
MAC Address	Displays a read-only field that is factory set by AMX for the built-in Ethernet interface.
Master Connection	Sets the NetLinx Master communication values:
Ethernet Type	Sets the NetLinx Master to communicate to the TPI-PRO via Ethernet. Ethernet uses a CAT-5 cable (10/100Base T terminated in an RJ-45 connector) to network computers together and is used in most LAN (local area networks). This description is also used to refer to both wired and wireless communication.
Type	Cycles between the different connection modes (URL, Listen, Auto, NDP (UDP), and URL (UDP)) • **URL** - In this mode, enter the IP/URL, Master Port Number, and username/password (if used) on the Master. - The System Number field is read-only because the TPI-PRO obtains this information from the communicating Master. • **Listen** - In this mode, add the TPI-PRO address into the URL List in NetLinx Studio and set the connection mode to Listen. This mode allows the TPI-PRO to "listen" for the Master's communication signals. - The System Number and Master IP/URL fields are read-only. • **Auto** - In this mode, enter the System Number and a username/password (if applicable). This mode is used when both the TPI-PRO and the NetLinx Master are on the same Subnet and the Master has its UDP feature enabled. - Master IP/URL field is read-only. • **NDP (UDP)** - In this mode, enter the IP/URL, Master Port Number, and username/password (if used) on the Master. • **URL (UDP)** - In this mode, enter the IP/URL, Master Port Number, and username/password (if used) on the Master.
System Number	Allows you to enter a system number. • Default value is 0 (zero).
Master IP/URL	Sets the Master IP or URL of the NetLinx Master.
Master Port Number	Allows you to enter the port number used with the NetLinx Master. • Default value is 1319.
Username/Password	If the target Master has been previously secured, enter the alpha-numeric string (into each field) assigned to a pre-configured user profile on the Master. This profile should have the pre-defined level of access/configuration rights.
NDP Name	

Refer to the *Step 2: Choosing a Master Connection Mode Setting* section on page 34 and *Step 3: Configuring the Ethernet Connection Type* section on page 34 for more detailed information on using the System Settings page.

Cache Page

The Cache page (FIG. 50) configures the allocation of memory for image caching. The G4 graphics engine caches images to decrease load time of previously viewed images. RAM caching is always enabled, and images (both static and dynamic) are stored in the RAM cache as they are viewed. The size of RAM cache is automatically configured to take into account available memory versus memory that may be needed by the panel later. As the RAM cache approaches its maximum size, the oldest items in the cache may be discarded to make room for newer items. If Flash caching is enabled, dynamic images that would have been discarded will be moved to Flash, since it is typically faster to retrieve images on Flash than across a network (although it is slower than RAM cache). Note that since static images are already stored on Flash, they are never moved to the Flash cache, so Flash caching applies only to dynamic images. Images in Flash cache are moved back to RAM cache the next time they are viewed. As the Flash cache approaches its maximum size, the least recently used items may be discarded to make room for new items.

Flash memory can be allocated for image caching, but RAM cache is always enabled. Flash memory is a secondary cache and is much slower than RAM cache, as it uses Compact Flash to store images. Flash memory should not be used frequently, but it may be appropriate to use Flash memory in some environments that are dynamic image intensive, at times when RAM cache is easily exhausted and the time taken to access Flash memory would be faster than network latency. For example, when large dynamic images are being used over slow wireless links, putting the images into Flash memory can help the situation, as the panel could spend more resources processing information rather than continuously waiting on images to arrive from a slow network.

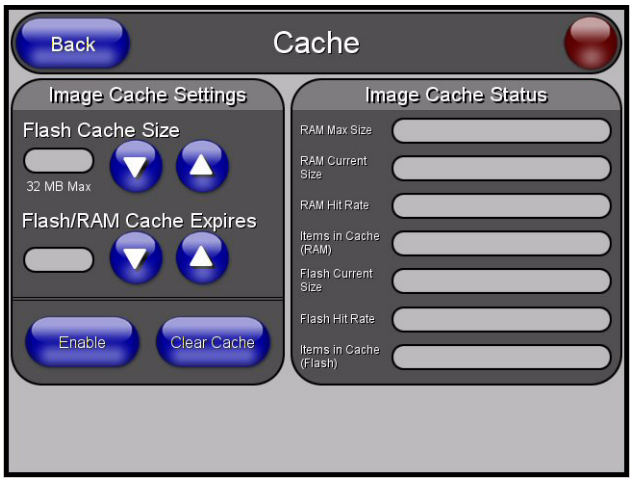


FIG. 50 Cache page

The elements of the Cache page are described in the following table:

Image Caching Page Elements	
Back	Saves all changes and returns to the previous page.
Connection Status icon	The icon in the upper-right corner of each Setup page shows online/offline state of the panel to the master. • Bright red - disconnected • Bright green - connected. Blinks when a blink message is received to dark green every 5 seconds for half a second then go back to bright green. • Bright yellow - panel missed a blink message from the master. It will remain yellow for 3 missed blink messages and then turn red. It will return to green when a blink message is received. ***Note**: A Lock appears on the icon if the panel is connected to a secured NetLinx Master.*
Image Cache Settings	Allocates Flash memory for image caching.
Flash Cache Size	Press the Up and Down arrows to add and remove memory. Flash memory allocation cannot exceed the amount of Flash memory on the panel.
Flash/RAM Cache Expires	Press the Up and Down arrows to change the amount of time the images stay in cache memory. The options are: • Never • 2 Hours • 8 Hours • 1 Day • 2 Days • 5 Days
Enable	Press this button to toggle the image Flash cache option On and Off.
Clear Cache	Press this button to clear both the Flash and RAM cache of all stored images.
Image Cache Status	The status of the memory available versus in use.
RAM Max Size	The maximum amount of memory available for all image caching.
RAM Current Size	The memory that is currently in use for caching static and dynamic images.
RAM Hit Rate	The percentage of image requests (static and dynamic) satisfied by accessing the cache. 100 * (# of cache hits) / (# of cache hits + # of cache misses) # of cache hits - the number of times an image was requested that the image was found in the cache. If your hit rate is low, you may want to consider enabling Flash cache. # of cache misses - the number of times an image was requested that the image could not be found in the cache, and the image had to either be loaded from flash or obtained via the network (for dynamic images). It is considered a RAM Cache Miss even if the image is subsequently found in flash cache.
Items in Cache (RAM)	The number of images that are currently stored in the RAM cache.
Flash Current Size	The maximum flash space allocated for image caching. Flash space is used for caching only when there is not enough available memory in the RAM cache for a newly requested image (it is used only for dynamic images).
Flash Hit Rate	The percentage of image requests (dynamic only) that are satisfied by accessing the flash cache. 100 * (# of flash cache hits) / (# of flash cache hits + # of flash cache misses) # of flash cache hits - # of times a dynamic image could not be found in RAM cache but was found in flash cache # of flash cache misses - # of times a dynamic image could not be found in either RAM or flash cache. RAM cache hits are not relevant in this calculation.
Items in Cache (Flash)	The number of images that are currently stored in the Flash cache.

Setting the image cache

In the *Protected Setup* page:

1. Press the **Other Settings** button to open an options slide bar.
2. Press the **Cache** button in the slide bar. The Cache page opens.
3. Set the cache expiration in the field *Flash/RAM Cache Expires*. The Up and Down arrows increment through the available time frames.
4. Press the **Enable** button to turn on image caching. The button appears illuminated when enabled.

Select the Up and Down arrows for the field *Flash Cache Size* to increase or reduce the amount of Flash memory used; the maximum amount of flash that can be allocated for caching is 75% of available flash.

Clearing the image cache

In the *Protected Setup* page:

1. Press the **Other Settings** button to open an options slide bar.
2. Press the **Cache** button in the slide bar. The Cache page opens.
3. Press **Clear Cache**. This clears all image cache currently stored on the panel (both Flash and RAM).

Checking image cache status

In the *Protected Setup* page:

1. Press the **Other Settings** button to open an options slide bar.
2. Press the **Cache** button in the slide bar. The Cache page opens. All status information is located in the *Image Cache Status* section of the page.

Panel Logs Page

The Panel Logs page allow you to view and track the connection history of the panel.

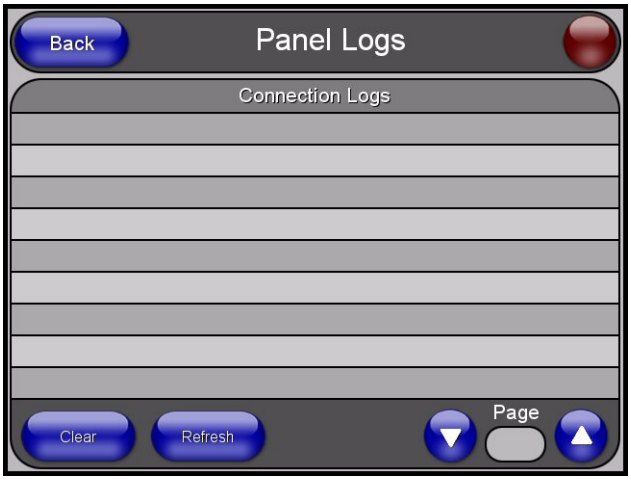


FIG. 51 Panel Logs page

The elements of the Panel Logs page are described in the following table:

Panel Logs Page	
Back	Saves all changes and returns to the previous page.
Connection Status icon	The icon in the upper-right corner of each Setup page shows online/offline state of the panel to the master. • Bright red - disconnected • Bright green - connected. Blinks when a blink message is received to dark green every 5 seconds for half a second then go back to bright green. • Bright yellow - panel missed a blink message from the master. It will remain yellow for 3 missed blink messages and then turn red. It will return to green when a blink message is received. ***Note**: A Lock appears on the icon if the panel is connected to a secured NetLinx Master.*
Connection Logs	A history of all connections, attempts, and failures for the panel.
Clear	Clears the Connection Logs history.
Refresh	Refreshes the Connection Logs history.
Page	Indicates the current page of the Connection Logs. Use the Up and Down arrows to move from one page to the next.

Checking the Panel Connection Logs

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the *Tools* menu.
2. Within the *Tools* menu, press the **Panel Logs** button. All connection data is contained in the section *Connection Logs*.

Refreshing the Panel Connections Log

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the *Tools* menu.
2. Within the *Tools* menu, press the **Panel Logs** button.
3. Push the **Refresh** button.

Clearing the Panel Connections Log

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the *Tools* menu.
2. Within the *Tools* menu, press the **Panel Logs** button.
3. Push the **Clear** button.
4. Confirm your selection.

Panel Statistics Page

The options on the Panel Statistics page allow you to track the connection status for the panel. The *Panel Statistics* page tracks ICSP messages, Blink messages, Ethernet connection statistics, and Wireless connection statistics (FIG. 52).

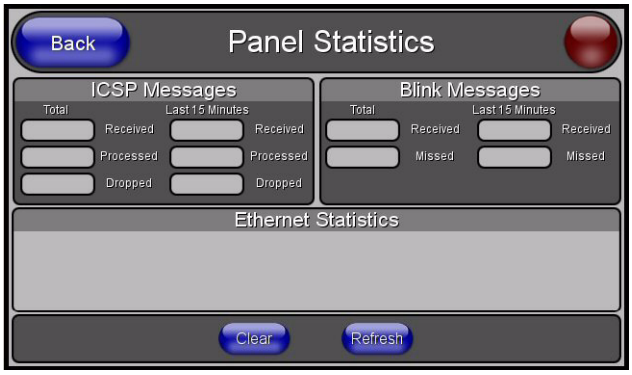


FIG. 52 Panel Statistics page

The elements of the Panel Statistics page are described in the following table:

Panel Statistics Page	
Back	Saves all changes and returns to the previous page.
Connection Status icon	The icon in the upper-right corner of each Setup page shows online/offline state of the panel to the master. • Bright red - disconnected • Bright green - connected. Blinks when a blink message is received to dark green every 5 seconds for half a second then go back to bright green. • Bright yellow - panel missed a blink message from the master. It will remain yellow for 3 missed blink messages and then turn red. It will return to green when a blink message is received. ***Note**: a Lock appears on the icon if the panel is connected to a secured NetLinx Master.*
ICSP Messages	Messages sent between the master and the touch panel; it is the protocol they use to communicate to each other.
Total	• Received - The total ICSP messages received by the panel. • Processed - The total ICSP messages processed by the panel. • Dropped - The total ICSP messages dropped by the panel.
Last 15 Minutes	• Received - The total ICSP messages received by the panel in the last 15 minutes. • Processed - The total ICSP messages processed by the panel in the last 15 minutes. • Dropped - The total ICSP messages dropped by the panel in the last 15 minutes.
Blink Messages	The master sends this message once every 5 seconds to all connected devices.
Total	• Received - The total Blink messages received by the panel. • Missed - The total Blink messages missed by the panel.
Last 15 Minutes	• Received - The total Blink messages received by the panel in the last 15 minutes. • Missed - The total Blink messages missed by the panel in the last 15 minutes.
Ethernet Statistics	The Ethernet connection statistics for the panel.
Clear	Clears all panel connection statistics.
Refresh	Refreshes all panel connection statistics.

Checking the Panel Statistics

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the *Tools* menu.
2. Within the *Tools* menu, press the **Panel Statistics** button. All connection statistics are contained on this page, e.g., *Received, Processed,* and *Dropped ICSP Messages*.

Refreshing the Panel Statistics

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the *Tools* menu.
2. Within the *Tools* menu, press the **Panel Statistics** button.
3. Push the **Refresh** button.

Clearing the Panel Statistics

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the *Tools* menu.
2. Within the *Tools* menu, press the **Panel Statistics** button.
3. Push the **Clear** button.
4. Confirm your selection.

Connection Utility Page

The options on the Connection Utility page allows you to view query and response statistics for your connection.

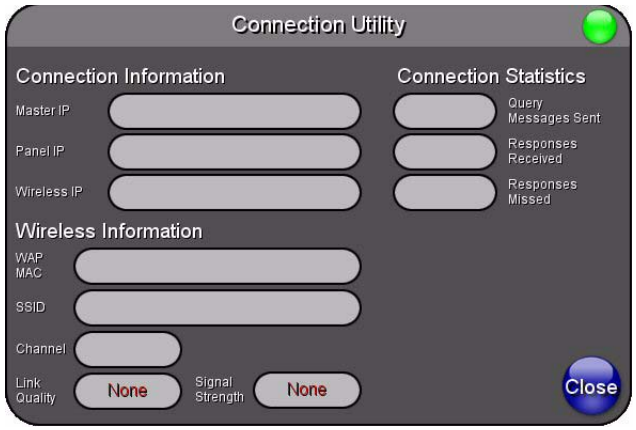


FIG. 53 Connection Utility page

The elements of the Connection Utility page are described in the following table:

Connection Utility Page	
Close	Saves all changes and returns to the previous page.
Connection Status icon	The icon in the upper-right corner of each Setup page shows online/offline state of the panel to the master. • Bright red - disconnected • Bright green - connected. Blinks when a blink message is received to dark green every 5 seconds for half a second then go back to bright green. • Bright yellow - panel missed a blink message from the master. It will remain yellow for 3 missed blink messages and then turn red. It will return to green when a blink message is received. ***Note**: A Lock appears on the icon if the panel is connected to a secured NetLinx Master.*
Connection Information	
Master IP	Displays the IP address of the network's Master.
Panel IP	Displays the IP address of the touch panel.
Wireless Information	
WAP MAC	The MAC Address for the WAP currently in use. If the MAC Address changes, it means the panel has switched/roamed to a different access point. This can be used to determine coverage for each access point and help isolate "brown" areas where coverage is minimal or non-existent, and thus require another access installed.
SSID	Displays the currently used SSID of the target WAP.
Channel	The RF channel being used for connection to the WAP (read-only).
Data Rate	The data rate (in Mbps) at which the panel is currently communicating with the target WAP. ***Note:** Data rates for 802.11b communication are: 1, 2, 5.5, and 11 Mbps.*
Link Quality	Displays the quality of the link from the wireless NIC to the Wireless Access Point (direct sequence spread spectrum) in real time (None, Poor, Fair, Good, Very Good, and Excellent). • Even when link quality is at its lowest you still have a connection, and the ability to transmit and receive data, even if at lower speeds. ***Note:** "Link Quality" and "Signal Strength" are applicable to RF connections only. It is possible to have an RF signal to a WAP, but be unable to communicate with it because of either incorrect IP or encryption settings.*

Connection Utility Page (Cont.)	
Signal Strength	This indicator displays a description of the signal strength from the Wireless Access Point connection in real time (*None, Poor, Fair, Good, Very Good, and Excellent*). SNR (Signal Noise Ratio) is a measure of the relative strength of a wireless RF connection. Given this value and the link quality above, you can determine the noise level component of the SNR. For example, if signal strength is high but the link quality is low, then the cause of the link degradation is noise. However, if signal strength is low and link quality is low the cause would simply be signal strength.
Connection Statistics	
Query Messages Sent	Displays the number of query messages sent from the panel to the Master.
Responses Received	Displays the number of responses the panel has received from the Master.
Responses Missed	Displays the number of expected responses from the Master that the panel missed.

Using the Connection Utility

1. Press the **Tools** button in the Protected Setup Navigation Buttons section. This opens the Tools menu.
2. Within the Tools menu, press the **Connection Utility** button. This launches the Connection Utility page.
3. Move the panel throughout your wireless network, and changes within the utility. The Connection Information notes the IP of the connected master and the IP of your panel. The Wireless Information indicates the current wireless connection method for the panel, e.g., the MAC Address for the WAP currently in use. The Connection Statistics show the current quality of the panel connection.
4. Push **Close** when you are done using the site survey tool.

Programming

You can program a touch panel using the commands in this section to perform a wide variety of operations using Send_Commands and variable text commands. Refer to the *NetLinx Programming Language* instruction manual for complete information.



Verify you are using the latest NetLinx Master firmware. Verify the NetLinx Studio program being used is version 2.4 or higher and TPD4 is version 2.8 or higher.

Button Assignments

- Button Channel Range: 1 - 4000 Button push and Feedback (per address port)
- Button Variable Text range: 1 - 4000 (per address port)
- Button States Range: 1 - 256
 (0 = All states, for General buttons 1 = Off state and 2 = On state).
- Level Range: 1 - 600 (Default level value 0 - 255, can be set up to 1 - 65535)
- Address port Range: 1 - 100



Button assignments can only be adjusted in TPD4, not on the panels themselves.

You can program the TPI-PRO using the commands described in this section to perform a wide variety of operations.

A device must first be defined in the NetLinx programming language with values for the Device: Port: System (in all programming examples - ***Panel*** is used in place of these values and represents all compatible G4 devices).

Page Commands

The following NetLinx Page Commands are supported by the TPI-PRO, and are not case sensitive.

Page Commands	
@APG Add a specific popup page to a specified popup group.	Add the popup page to a group if it does not already exist. If the new popup is added to a group which has a popup displayed on the current page along with the new pop-up, the displayed popup will be hidden and the new popup will be displayed. Syntax: `"'@APG-<popup page name>;<popup group name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. popup group name = 1 - 50 ASCII characters. Name of the popup group. Example: `SEND_COMMAND Panel,"'@APG-Popup1;Group1'"` Adds the popup page 'Popup1' to the popup group 'Group1'.

Page Commands (Cont.)	
@CPG Clear all popup pages from specified popup group.	Syntax: "'@CPG-<popup group>'" Variable: popup group = 1 - 50 ASCII characters. Name of the popup group. Example: SEND_COMMAND Panel,"'@CPG-Group1'" Clears all popup pages from the popup group 'Group1'.
@DPG Delete a specific popup page from specified popup group if it exists.	Syntax: "'@DPG-<popup page name>;<popup group name>'" Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. popup group name = 1 - 50 ASCII characters. Name of the popup group. Example: SEND_COMMAND Panel,"'@DPG-Popup1;Group1'" Deletes the popup page 'Popup1' from the popup group 'Group1'.
@PDR Set the popup location reset flag.	If the flag is set, the popup will return to its default location on show instead of its last drag location. Syntax: "'@PDR-<popup page name>;<reset flag>'" Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. reset flag = 1 = Enable reset flag 0 = Disable reset flag Example: SEND_COMMAND Panel,"'@PDR-Popup1;1'" Popup1 will return to its default location when turned On.
@PHE Set the hide effect for the specified popup page to the named hide effect.	Syntax: "'@PHE-<popup page name>;<hide effect name>'" Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. hide effect name = Refers to the popup effect names being used. Example: SEND_COMMAND Panel,"'@PHE-Popup1;Slide Left'" Sets the Popup1 hide effect name to 'Slide Left'.
@PHP Set the hide effect position.	Only 1 coordinate is ever needed for an effect, however, the command will specify both. This command sets the location at which the effect will end at. Syntax: "'@PHP-<popup page name>;<x coordinate>,<y coordinate>'" Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: SEND_COMMAND Panel,"'@PHP-Popup1;75,0'" Sets the Popup1 hide effect x-coordinate value to 75 and the y-coordinate value to 0.

Page Commands (Cont.)	
@PHT Set the hide effect time for the specified popup page.	Syntax: `"'@PHT-<popup page name>;<hide effect time>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. hide effect time = Given in 1/10ths of a second. Example: `SEND_COMMAND Panel,"'@PHT-Popup1;50'"` Sets the Popup1 hide effect time to 5 seconds.
@PPA Close all popups on a specified page.	*If the page name is empty, the current page is used.* Same as the 'Clear Page' command in TPDesign4. Syntax: `"'@PPA-<page name>'"` Variable: page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'@PPA-Page1'"` Close all popups on Page1.
@PPF Deactivate a specific popup page on either a specified page or the current page.	*If the page name is empty, the current page is used (see example 2).* If the popup page is part of a group, the whole group is deactivated. This command works in the same way as the 'Hide Popup' command in TPDesign4. Syntax: `"'@PPF-<popup page name>;<page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'@PPF-Popup1;Main'"` Deactivates the popup page 'Popup1' on the Main page. Example 2: `SEND_COMMAND Panel,"'@PPF-Popup1'"` Deactivates the popup page 'Popup1' on the current page.
@PPG Toggle a specific popup page on either a specified page or the current page.	*If the page name is empty, the current page is used (see example 2).* Toggling refers to the activating/deactivating (On/Off) of a popup page. This command works in the same way as the 'Toggle Popup' command in TPDesign4. Syntax: `"'@PPG-<popup page name>;<page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'@PPG-Popup1;Main'"` Toggles the popup page 'Popup1' on the 'Main' page from one state to another (On/Off). Example 2: `SEND_COMMAND Panel,"'@PPG-Popup1'"` Toggles the popup page 'Popup1' on the current page from one state to another (On/Off).

Page Commands (Cont.)	
@PPK Kill a specific popup page from all pages.	Kill refers to the deactivating (Off) of a popup window from all pages. If the pop-up page is part of a group, the whole group is deactivated. This command works in the same way as the 'Clear Group' command in TPDesign4. Syntax: `"'@PPK-<popup page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. Example: `SEND_COMMAND Panel,"'@PPK-Popup1'"` Kills the popup page 'Popup1' on all pages.
@PPM Set the modality of a specific popup page to Modal or NonModal.	A Modal popup page, when active, only allows you to use the buttons and features on that popup page. All other buttons on the panel page are inactivated. Syntax: `"'@PPM-<popup page name>;<mode>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. mode = NONMODAL converts a previously Modal popup page to a NonModal. MODAL converts a previously NonModal popup page to Modal. ***modal = 1 and non-modal = 0*** Example: `SEND_COMMAND Panel,"'@PPM-Popup1;Modal'"` Sets the popup page 'Popup1' to Modal. `SEND_COMMAND Panel,"'@PPM-Popup1;1'"` Sets the popup page 'Popup1' to Modal.
@PPN Activate a specific popup page to launch on either a specified page or the current page.	*If the page name is empty, the current page is used (see example 2).* If the popup page is already on, do not re-draw it. This command works in the same way as the 'Show Popup' command in TPDesign4. Syntax: `"'@PPN-<popup page name>;<page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'@PPN-Popup1;Main'"` Activates 'Popup1' on the 'Main' page. Example 2: `SEND_COMMAND Panel,"'@PPN-Popup1'"` Activates the popup page 'Popup1' on the current page.

Page Commands (Cont.)	
@PPT Set a specific popup page to timeout within a specified time.	If timeout is empty, popup page will clear the timeout. Syntax: `"'@PPT-<popup page name>;<timeout>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. timeout = Timeout duration in 1/10ths of a second. Example: `SEND_COMMAND Panel,"'@PPT-Popup1;30'"` Sets the popup page 'Popup1' to timeout within 3 seconds.
@PPX Close all popups on all pages.	Same as a 'Clear All' command in TPDesign 4. Syntax: `"'@PPX'"` Example: `SEND_COMMAND Panel,"'@PPX'"` Close all popups on all pages.
@PSE Set the show effect for the specified popup page to the named show effect.	Only 1 coordinate is ever needed for an effect, however the command will specify both. This command sets the location at which the effect will begin at. Syntax: `"'@PSE-<popup page name>;<show effect name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. show effect name = Refers to the popup effect name being used. Example: `SEND_COMMAND Panel,"'@PSE-Popup1;Slide from Left'"` Sets the Popup1 show effect name to 'Slide from Left'.
@PSP Set the show effect position.	Only 1 coordinate is ever needed for an effect; however, the command will specify both. This command sets the location at which the effect will begin at. Syntax: `"'@PSP-<popup page name>;<x coordinate>,<y coordinate>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'@PSP-Popup1;100,0'"` Sets the Popup1 show effect x-coordinate value to 100 and the y-coordinate value to 0.
@PST Set the show effect time for the specified popup page.	Syntax: `"'@PST-<popup page name>;<show effect time>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. show effect time = Given in 1/10ths of a second. Example: `SEND_COMMAND Panel,"'@PST-Popup1;50'"` Sets the Popup1 show effect time to 5 seconds.

Page Commands (Cont.)	
PAGE Flip to a specified page.	Flips to a page with a specified page name. If the page is currently active, it will not redraw the page. Syntax: `"'PAGE-<page name>'"` Variable: page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'PAGE-Page1'"` Flips to page1.
PPOF Deactivate a specific popup page on either a specified page or the current page.	*If the page name is empty, the current page is used (see example 2).* If the popup page is part of a group, the whole group is deactivated. This command works in the same way as the 'Hide Popup' command in TPDesign4. Syntax: `"'PPOF-<popup page name>;<page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'PPOF-Popup1;Main'"` Deactivates the popup page 'Popup1' on the Main page. Example 2: `SEND_COMMAND Panel,"'PPOF-Popup1'"` Deactivates the popup page 'Popup1' on the current page.
PPOG Toggle a specific popup page on either a specified page or the current page.	*If the page name is empty, the current page is used (see example 2).* Toggling refers to the activating/deactivating (On/Off) of a popup page. This command works in the same way as the 'Toggle Popup' command in TPDesign4. Syntax: `"'PPOG-<popup page name>;<page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'PPOG-Popup1;Main'"` Toggles the popup page 'Popup1' on the Main page from one state to another (On/Off). Example 2: `SEND_COMMAND Panel,"'PPOG-Popup1'"` Toggles the popup page 'Popup1' on the current page from one state to another (On/Off).

Page Commands (Cont.)	
PPON Activate a specific popup page to launch on either a specified page or the current page.	*If the page name is empty, the current page is used (see example 2).* If the popup page is already On, do not re-draw it. This command works in the same way as the 'Show Popup' command in TPDesign4. Syntax: `"'PPON-<popup page name>;<page name>'"` Variable: popup page name = 1 - 50 ASCII characters. Name of the popup page. page name = 1 - 50 ASCII characters. Name of the page on which the popup is displayed. Example: `SEND_COMMAND Panel,"'PPON-Popup1; Main'"` Activates the popup page 'Popup1' on the Main page. Example 2: `SEND_COMMAND Panel,"'PPON-Popup1'"` Activates the popup page 'Popup1' on the current page.

Programming Numbers

The following information provides the programming numbers for colors, fonts, and borders.

Colors can be used to set the colors on buttons, sliders, and pages. The lowest color number represents the lightest color-specific display; the highest number represents the darkest display. For example, 0 represents light red, and 5 is dark red. The following table lists the RGB color values and names for standard 88 colors.

RGB triplets and names for basic 88 colors

RGB Values for all 88 Basic Colors				
Index No.	Name	Red	Green	Blue
00	Very Light Red	255	0	0
01	Light Red	223	0	0
02	Red	191	0	0
03	Medium Red	159	0	0
04	Dark Red	127	0	0
05	Very Dark Red	95	0	0
06	Very Light Orange	255	128	0
07	Light Orange	223	112	0
08	Orange	191	96	0
09	Medium Orange	159	80	0
10	Dark Orange	127	64	0
11	Very Dark Orange	95	48	0
12	Very Light Yellow	255	255	0
13	Light Yellow	223	223	0
14	Yellow	191	191	0
15	Medium Yellow	159	159	0
16	Dark Yellow	127	127	0
17	Very Dark Yellow	95	95	0
18	Very Light Lime	128	255	0
19	Light Lime	112	223	0

RGB Values for all 88 Basic Colors (Cont.)				
Index No.	Name	Red	Green	Blue
20	Lime	96	191	0
21	Medium Lime	80	159	0
22	Dark Lime	64	127	0
23	Very Dark Lime	48	95	0
24	Very Light Green	0	255	0
25	Light Green	0	223	0
26	Green	0	191	0
27	Medium Green	0	159	0
28	Dark Green	0	127	0
29	Very Dark Green	0	95	0
30	Very Light Mint	0	255	128
31	Light Mint	0	223	112
32	Mint	0	191	96
33	Medium Mint	0	159	80
34	Dark Mint	0	127	64
35	Very Dark Mint	0	95	48
36	Very Light Cyan	0	255	255
37	Light Cyan	0	223	223
38	Cyan	0	191	191
39	Medium Cyan	0	159	159
40	Dark Cyan	0	127	127
41	Very Dark Cyan	0	95	95
42	Very Light Aqua	0	128	255
43	Light Aqua	0	112	223
44	Aqua	0	96	191
45	Medium Aqua	0	80	159
46	Dark Aqua	0	64	127
47	Very Dark Aqua	0	48	95
48	Very Light Blue	0	0	255
49	Light Blue	0	0	223
50	Blue	0	0	191
51	Medium Blue	0	0	159
52	Dark Blue	0	0	127
53	Very Dark Blue	0	0	95
54	Very Light Purple	128	0	255
55	Light Purple	112	0	223
56	Purple	96	0	191
57	Medium Purple	80	0	159
58	Dark Purple	64	0	127
59	Very Dark Purple	48	0	95
60	Very Light Magenta	255	0	255
61	Light Magenta	223	0	223
62	Magenta	191	0	191
63	Medium Magenta	159	0	159

RGB Values for all 88 Basic Colors (Cont.)				
Index No.	Name	Red	Green	Blue
64	Dark Magenta	127	0	127
65	Very Dark Magenta	95	0	95
66	Very Light Pink	255	0	128
67	Light Pink	223	0	112
68	Pink	191	0	96
69	Medium Pink	159	0	80
70	Dark Pink	127	0	64
71	Very Dark Pink	95	0	48
72	White	255	255	255
73	Grey1	238	238	238
74	Grey3	204	204	204
75	Grey5	170	170	170
76	Grey7	136	136	136
77	Grey9	102	102	102
78	Grey4	187	187	187
79	Grey6	153	153	153
80	Grey8	119	119	119
81	Grey10	85	85	85
82	Grey12	51	51	51
83	Grey13	34	34	34
84	Grey2	221	221	221
85	Grey11	68	68	68
86	Grey14	17	17	17
87	Black	0	0	0
255	TRANSPARENT	99	53	99

Font styles and ID numbers

Font styles can be used to program the text fonts on buttons, sliders, and pages. The following chart shows the default font type and their respective ID numbers generated by TPDesign4.

Default Font Styles and ID Numbers					
Font ID #	Font type	Size	Font ID #	Font type	Size
1	Courier New	9	19	Arial	9
2	Courier New	12	20	Arial	10
3	Courier New	18	21	Arial	12
4	Courier New	26	22	Arial	14
5	Courier New	32	23	Arial	16
6	Courier New	18	24	Arial	18
7	Courier New	26	25	Arial	20
8	Courier New	34	26	Arial	24
9	AMX Bold	14	27	Arial	36
10	AMX Bold	20	28	Arial Bold	10
11	AMX Bold	36	29	Arial Bold	8
			32 - Variable Fonts start at 32.		



*You must import fonts into a TPDesign4 project file. The font ID numbers are assigned by TPDesign4. These values are also listed in the **Generate Programmer's Report**.*

Border styles

The TPDesign4 Touch Panel Design program has pre-set border styles that are user selectable. TPD4 border styles can ONLY be changed by using the name.

TPD4 Border Styles by Name	
Border styles	Border styles
None	Diamond 55
AMX Elite -L	Diamond 65
AMX Elite -M	Diamond 75
AMX Elite -S	Double Bevel -L
Bevel -L	Double Bevel -M
Bevel -M	Double Bevel -S
Bevel -S	Double Line
Circle 15	Fuzzy
Circle 25	Glow-L
Circle 35	Help Down
Circle 45	Help Down Reversed
Circle 55	Menu Bottom Rounded 15
Circle 65	Menu Bottom Rounded 25
Circle 75	Menu Bottom Rounded 35
Circle 85	Menu Bottom Rounded 45
Circle 95	Menu Bottom Rounded 55
Circle 105	Menu Bottom Rounded 65
Circle 115	Menu Bottom Rounded 75
Circle 125	Menu Bottom Rounded 85
Circle 135	Menu Bottom Rounded 95
Circle 145	Menu Bottom Rounded 105
Circle 155	Menu Bottom Rounded 115
Circle 165	Menu Bottom Rounded 125
Circle 175	Menu Bottom Rounded 135
Circle 185	Menu Bottom Rounded 145
Circle 195	Menu Bottom Rounded 155
Cursor Bottom	Menu Bottom Rounded 165
Cursor Bottom with Hole	Menu Bottom Rounded 175
Cursor Top	Menu Bottom Rounded 185
Cursor Top with Hole	Menu Bottom Rounded 195
Cursor Left	Menu Left Rounded 15
Cursor Left with Hole	Menu Left Rounded 25
Cursor Right	Menu Left Rounded 35
Cursor Right with Hole	Menu Left Rounded 45
Custom Frame	Menu Left Rounded 55

TPD4 Border Styles by Name (Cont.)	
Diamond 15	Menu Left Rounded 65
Diamond 25	Menu Left Rounded 75
Diamond 35	Menu Left Rounded 85
Diamond 45	Menu Left Rounded 95
Menu Left Rounded 105	Menu Top Rounded 65
Menu Left Rounded 115	Menu Top Rounded 75
Menu Left Rounded 125	Menu Top Rounded 85
Menu Left Rounded 135	Menu Top Rounded 95
Menu Left Rounded 145	Menu Top Rounded 105
Menu Left Rounded 155	Menu Top Rounded 115
Menu Left Rounded 165	Menu Top Rounded 125
Menu Left Rounded 175	Menu Top Rounded 135
Menu Left Rounded 185	Menu Top Rounded 145
Menu Left Rounded 195	Menu Top Rounded 155
Menu Right Rounded 15	Menu Top Rounded 165
Menu Right Rounded 25	Menu Top Rounded 175
Menu Right Rounded 35	Menu Top Rounded 185
Menu Right Rounded 45	Menu Top Rounded 195
Menu Right Rounded 55	Neon Active -L
Menu Right Rounded 65	Neon Active -S
Menu Right Rounded 75	Neon Inactive -L
Menu Right Rounded 85	Neon Inactive -S
Menu Right Rounded 95	Oval V 30x60
Menu Right Rounded 105	Oval V 50x100
Menu Right Rounded 115	Oval V 75x150
Menu Right Rounded 125	Oval V 100x200
Menu Right Rounded 135	Oval H 60x30
Menu Right Rounded 145	Oval H 100x50
Menu Right Rounded 155	Oval H 150x75
Menu Right Rounded 165	Oval H 200x100
Menu Right Rounded 175	Picture Frame
Menu Right Rounded 185	Quad Line
Menu Right Rounded 195	Single Line
Menu Rounded Spacer - Vertical	Windows Style Popup
Menu Rounded Spacer - Horizontal	Windows Style Popup (Status Bar)
Menu Top Rounded 55	

"^" Button Commands

These Button Commands are not case sensitive.

All commands that begin with "^" have the capability of assigning a variable text address range and button state range. **A device must first be defined in the NetLinx programming language with values for the Device: Port : System** (in all programming examples - ***Panel*** is used in place of these values).

- **Variable text ranges** allow you to target one or more variable text channels in a single command.
- **Button State ranges** allow you to target one or more states of a variable text button state with a single command.
- The **"."** character is used for 'through' notation, and the "**&**" character is used for 'And' notation.

"^" Button Commands	
^ANI Run a button animation (in 1/10 second).	Syntax: `"'^ANI-<vt addr range>,<start state>,<end state>,<time>'"` Variable: variable text address range = 1 - 4000. start state = Beginning of button state (0= current state). end state = End of button state. time = in 1/10 second intervals. Example: `SEND_COMMAND Panel,"'^ANI-500,1,25,100'"` Runs a button animation at text address 500 from state 1 to state 25 for 10 second.
^APF Add page flip action to a button if it does not already exist.	Syntax: `"'^APF-<vt addr range>,<page flip action>,<page name>'"` Variable: variable text address range = 1 - 4000. page flip action = **Stan**[dardPage] - Flip to standard page **Prev**[iousPage] - Flip to previous page **Show**[Popup] - Show Popup page **Hide**[Popup] - Hide Popup page **Togg**[lePopup] - Toggle popup state **ClearG**[roup] - Clear popup page group from all pages **ClearP**[age] - Clear all popup pages from a page with the specified page name **ClearA**[ll] - Clear all popup pages from all pages page name = 1 - 50 ASCII characters. Example: `SEND COMMAND Panel,"'^APF-400,Stan,Main Page'"` Assigns button address 400 to a standard page flip with page name 'Main Page'.

"^" Button Commands (Cont.)	
^BAT Append non-unicode text.	Syntax: `"'^BAT-<vt addr range>,<button states range>,<new text>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). new text = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^BAT-520,1,Enter City'"` Appends the text 'Enter City' to the button's OFF state.
^BAU Append unicode text.	Same format as ^UNI. Syntax: `"'^BAU-<vt addr range>,<button states range>,<unicode text>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). unicode text = 1 - 50 ASCII characters. Unicode characters must be entered in Hex format. Example: `SEND_COMMAND Panel,"'^BAU-520,1,00770062'"` Appends Unicode text '00770062' to the button's OFF state.
^BCB Set the border color to the specified color.	**Only if** the specified border color is not the same as the current color. **Note**: Color can be assigned by color name (without spaces), number or R,G, B value (RRGGBB or RRGGBBAA). Syntax: `"'^BCB-<vt addr range>,<button states range>,<color value>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). color value = Refer to the RGB Values for all 88 Basic Colors table on page 81 for more information. Example: `SEND_COMMAND Panel,"'^BCB-500.504&510,1,12'"` Sets the Off state border color to 12 (Yellow). Colors can be set by Color Numbers, Color name, RGB alpha colors (RRGGBBAA) and RG & B color values (RRGGBB). Refer to the RGB Values for all 88 Basic Colors table on page 81.

"^" Button Commands (Cont.)	
^BCF Set the fill color to the specified color.	This command works **only if** the specified fill color is not the same as the current color. **Note**: Color can be assigned by color name (without spaces), number or R,G,B value (RRGGBB or RRGGBBAA). Syntax: `"'^BCF-<vt addr range>,<button states range>,<color value>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). color value = Refer to the RGB Values for all 88 Basic Colors table on page 81 for more information. Example: `SEND_COMMAND Panel,"'^BCF-500.504&510.515,1,12'"` `SEND_COMMAND Panel,"'^BCF-500.504&510.515,1,Yellow'"` `SEND_COMMAND Panel,"'^BCF-500.504&510.515,1,#F4EC0A63''"` `SEND_COMMAND Panel,"'^BCF-500.504&510.515,1,#F4EC0A'"` Sets the Off state fill color by color number. Colors can be set by Color Numbers, Color name, RGB alpha colors (RRGGBBAA) and R G & B color values (RRGGBB).
^BCT Set the text color to the specified color.	This command works **only if** the specified text color is not the same as the current color. **Note**: Color can be assigned by color name (without spaces), number or R,G,B value (RRGGBB or RRGGBBAA). Syntax: `"'^BCT-<vt addr range>,<button states range>,<color value>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). color value = Refer to the RGB Values for all 88 Basic Colors table on page 81 for more information. Example: `SEND_COMMAND Panel,"'^BCT-500.504&510,1,12'"` Sets the Off state border color to 12 (Yellow). Colors can be set by Color Numbers, Color name, RGB alpha colors (RRGGBBAA) and R G & B colors values (RRGGBB).

"^" Button Commands (Cont.)	
^BDO Set the button draw order.	Determines what order each layer of the button is drawn. Syntax: `"'^BDO-<vt addr range>,<button states range>,<1-5><1-5><1-5><1-5><1-5>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). layer assignments = 1 - Fill Layer 2 - Image Layer 3 - Icon Layer 4 - Text Layer 5 - Border Layer ***Note**: The layer assignments are from bottom to top. The default draw order is* **12345**. Example: `SEND_COMMAND Panel,"'^BDO-530,1&2,51432'"` Sets the button's variable text 530 ON/OFF state draw order (from bottom to top) to Border, Fill, Text, Icon, and Image. Example 2: `SEND_COMMAND Panel,"'^BDO-1,0,12345'"` Sets all states of a button back to its default drawing order.
^BFB Set the feedback type of the button.	This command only works on General-type buttons. Syntax: `"'^BFB-<vt addr range>,<feedback type>'"` Variable: variable text address range = 1 - 4000. feedback type = (None, Channel, Invert, On (Always on), Momentary, and Blink). Example: `SEND_COMMAND Panel,"'^BFB-500,Momentary'"` Sets the Feedback type of the button to 'Momentary'.

"^" Button Commands (Cont.)	
^BIM Set the input mask for the specified address.	Syntax: `"'^BIM-<vt addr range>,<input mask>'"` Variable: variable text address range = 1 - 4000. input mask = Refer to the *Text Area Input Masking* section on page 136 for character types. Example: `SEND_COMMAND Panel,"'^BIM-500,AAAAAAAAAA'"` Sets the input mask to ten 'A' characters, that are required, to either a letter or digit **(entry is required).**
^BLN Set the number of lines removed equally from the top and bottom of a composite video signal.	The maximum number of lines to remove is 240. A value of 0 will display the incoming video signal unaffected. This command is used to scale non 4x3 video images into non 4x3 video buttons. Syntax: `"'^BLN-<vt addr range>,<button states range>,<number of lines>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). number of lines = 0 - 240. Example: `SEND_COMMAND Panel,"'^BLN-500,55'"` Equally removes 55 lines from the top and 55 lines from the bottom of the video button.

"^" Button Commands (Cont.)	
^BMC Button copy command. Copy attributes of the source button to all the destination buttons.	Note that the source is a single button state. Each state must be copied as a separate command. The <codes> section represents what attributes will be copied. All codes are 2 character pairs that can be separated by comma, space, percent or just ran together. Syntax: `"'^BMC-<vt addr range>,<button states range>,<source port>,<source address>,<source state>,<codes>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). source port = 1 - 100 source address = 1 - 4000 source state = 1 - 256 codes: BM - Picture/Bitmap BR - Border CB - Border Color CF - Fill Color CT - Text Color EC - Text effect color EF - Text effect FT - Font IC - Icon JB - Bitmap alignment JI - Icon alignment JT - Text alignment LN - Lines of video removed OP - Opacity SO - Button Sound TX - Text VI - Video slot ID WW - Word wrap on/off Example: `SEND_COMMAND Panel,"'^BMC-425,1,1,500,1,BR'"` or `SEND_COMMAND Panel,"'^BMC-425,1,1,500,1,%BR'"` Copies the OFF state border of button with a variable text address of 500 onto the OFF state border of button with a variable text address of 425. Example 2: `SEND_COMMAND Panel,"'^BMC-150,1,1,315,1,%BR%FT%TX%BM%IC%CF%CT'"` Copies the OFF state border, font, Text, bitmap, icon, fill color and text color of the button with a variable text address of 315 onto the OFF state border, font, Text, bitmap, icon, fill color, and text color of the button with a variable text address of 150.

"^" Button Commands (Cont.)	
^BMF Set any/all button parameters by sending embedded codes and data.	Syntax: "'^BMF-<vt addr range>,<button states range>,<data>'" Variables: variable text address char array = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). level range = 1 - 600 (level value is 1 - 65535). data: '%B<border style>' = Set the border style name. See the Border styles table on page 84. '%B',<border 0-27,40,41> = Set the borer style number. See the Border styles table on page 84. '%DO<1-5><1-5><1-5><1-5><1-5> = Set the draw order. Listed from bottom to top. Refer to the ^BDO command on page 89 for more information. '%F', = Set the font. See the Default Font Styles and ID Numbers table on page 83. '%F' = Set the font. See the Default Font Styles and ID Numbers table on page 83. '%MI<mask image>' = Set the mask image. Refer to the ^BMI command on page 94 for more information. '%T<text >' = Set the text using ASCII characters (empty is clear). '%P<bitmap>' = Set the picture/bitmap filename (empty is clear). '%I',<icon 1-9900, 0-clear> = Set the icon using values of 1 - 9900 (icon numbers are assigned in the TPDesign4 Resource Manager tab - Slots section). '%I<icon 01-9900, 0-clear>' = Set the icon using values of 01 - 9900 (icon numbers are assigned in the TPDesign4 Resource Manager tab - Slots section). '%J',<alignment of text 1-9> = As shown the following telephone keypad alignment chart: 0 1 2 3 4 5 6 7 8 9 Zero can be used for an absolute position '%JT<alignment of text 0-9>' = As shown the above telephone keypad alignment chart, **BUT** the 0 (zero) is absolute and followed by **',<left>,<top>'** '%JB<alignment of bitmap/picture 0-9>' = As shown the above telephone keypad alignment chart BUT the 0 (zero) is absolute and followed by **',<left>,<top>'** '%JI<alignment of icon 0-9>' = As shown the above telephone keypad alignment chart, **BUT** the 0 (zero) is absolute and followed by **',<left>,<top>'**

"^" Button Commands (Cont.)	
^BMF (Cont.)	*For some of these commands and values, refer to* the RGB Values for all 88 Basic Colors table on page 81. '%CF<on fill color>' = Set Fill Color. '%CB<on border color>' = Set Border Color. '%CT<on text color>' = Set Text Color. '%SW<1 or 0>' = Show/hide a button. '%ST<style>' = Button style. '%SO<sound>' = Set the button sound. '%EN<1 or 0>' = Enable/disable a button. '%WW<1 or 0>' = Word wrap On/Off. '%GH<bargraph hi>' = Set the bargraph upper limit. '%GL<bargraph low>' = Set the bargraph lower limit. '%GN<bargraph slider name>' = Set the bargraph slider name/Joystick cursor name. '%GC<bargraph slider color>' = Set the bargraph slider color/Joystick cursor color. '%GI<bargraph invert>' = Set the bargraph invert/noninvert or joystick coordinate (0,1,2,3). See the *^GIV* section on page 100 more information. '%GU<bargraph ramp up>' = Set the bargraph ramp up time in intervals of 1/10 second. '%GD<bargraph ramp down>' = Set the bargraph ramp down time in 1/10 second. '%GG<bargraph drag increment> = Set the bargraph drag increment. Refer to the ^GDI command on page 100 for more information. '%VI<video on/off>' = Set the Video either On (value=1) or Off (value=0). '%OT<feedback type>' = Set the Feedback (Output) Type to one of the following: None, Channel,Invert, On (AlwaysOn), Momentary, or Blink. '%SM' = Submit a text for text area button. '%SF<1 or 0>' = Set the focus for text area button. '%OP<0-255>' = Set the button opacity to either Invisible (value=0) or Opaque (value=255). '%OP#<00-FF>' = Set the button opacity to either Invisible (value=00) or Opaque (value=FF). '%UN<Unicode text>' = Set the Unicode text. See the *^UNI* section on page 105 for the text format. '%LN<0-240>' = Set the lines of video being removed. See the *^BLN* section on page 90 for more information. '%EF<text effect name>' = Set the text effect. '%EC<text effect color>' = Set the text effect color. '%ML<max length>' = Set the maximum length of a text area. '%MK<input mask>' = Set the input mask of a text area. '%VL<0-1>' = Log-On/Log-Off the computer control connection '%VN<network name>' = Set network connection name. '%VP<password>' = Set the network connection password. Example: `SEND_COMMAND Panel,"'^BMF-500,1,%B10%CFRed%CB Blue %CTBlack%Ptest.png'"` Sets the button OFF state as well as the Border, Fill Color, Border Color, Text Color, and Bitmap.

"^" Button Commands (Cont.)	
^BMI Set the button mask image.	Mask image is used to crop a borderless button to a non-square shape. This is typically used with a bitmap. Syntax: `"'^BMI-<vt addr range>,<button states range>,<mask image>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). mask image = Graphic file used. Example: `SEND_COMMAND Panel,"'^BMI-530,1&2,newMac.png'"` Sets the button with variable text 530 ON/OFF state mask image to 'newmac.png'.
^BML Set the maximum length of the text area button.	If this value is set to zero (0) there is no max length. The maximum length available is 2000. This is only for a Text area input button and not for a Text area input masking button. Syntax: `"'^BML-<vt addr range>,<max length>'"` Variable: variable text address range = 1 - 4000. max length = 2000 (0=no max length). Example: `SEND_COMMAND Panel,"'^BML-500,20'"` Sets the maximum length of the text area input button to 20 characters.
^BMP Assign a picture to those buttons with a defined address range.	Syntax: `"'^BMP-<vt addr range>,<button states range>,<name of bitmap/ picture>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). name of bitmap/picture = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^BMP-500.504&510.515,1,bitmap.png'"` Sets the OFF state picture for the buttons with variable text ranges of 500-504 & 510-515.
^BNC Clear current TakeNote annotations.	Syntax: `"'^BNC-<vt addr range>,<command value>'"` Variable: variable text address range = 1 - 4000. command value = (0= clear, 1= clear all). Example: `SEND_COMMAND Panel,"'^BNC-973,0'"` Clears the annotation of the TakeNote button with variable text 973.

"^" Button Commands (Cont.)

^BNN Set the TakeNote network name for the specified Addresses.	Syntax: `"'^BNN-<vt addr range>,<network name>'"` Variable: variable text address range = 1 - 4000. network name = Use a valid IP Address. Example: `SEND_COMMAND Panel,"'^BNN-973,192.168.169.99'"` Sets the TakeNote button network name to 192.168.169.99.
^BNT Set the TakeNote network port for the specified Addresses.	Syntax: `"'^BNT-<vt addr range>,<network port>'"` Variable: variable text address range = 1 - 4000. network port = 1 - 65535. Example: `SEND_COMMAND Panel,"'^BNT-973,5000'"` Sets the TakeNote button network port to 5000.
^BOP Set the button opacity.	The button opacity can be specified as a decimal between 0 - 255, where zero (0) is invisible and 255 is opaque, or as a HEX code, as used in the color commands by preceding the HEX code with the # sign. In this case, #00 becomes invisible and #FF becomes opaque. If the opacity is set to zero (0), this does not make the button inactive, only invisible. Syntax: `"'^BOP-<vt addr range>,<button states range>,<button opacity>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). button opacity = 0 (invisible) - 255 (opaque). Example: `SEND_COMMAND Panel,"'^BOP-500.504&510.515,1,200'"` Example 2: `SEND_COMMAND Panel,"'^BOP-500.504&510.515,1,#C8'"` Both examples set the opacity of the buttons with the variable text range of 500-504 and 510-515 to 200.

"^" Button Commands (Cont.)

^BOR Set a border to a specific border style associated with a border value for those buttons with a defined address range.	Refer to the Border styles table on page 84 for more information. Syntax: `"'^BOR-<vt addr range>,<border style name or border value>'"` Variable: variable text address range = 1 - 4000. border style name = Refer to the Border styles table on page 84. border value = 0 - 41. Examples: `SEND_COMMAND Panel,"'^BOR-500.504&510.515,10'"` Sets the border by number (#10) to those buttons with the variable text range of 500-504 & 510-515. `SEND_COMMAND Panel,"'^BOR-500.504&510,AMX Elite -M'"` Sets the border by name (AMX Elite) to those buttons with the variable text range of 500-504 & 510-515. The border style is available through the TPDesign4 border-style drop-down list. Refer to the TPD4 Border Styles by Name table on page 84 for more information.
^BOS Set the video window slot ID # to the new Slot ID#.	The new Slot ID # is set only if the specified slot is not the same as the current slot selected. This is an optional parameter and ONLY passes data to the PC. Syntax: `"'^BOS-<vt addr range>,<button states range>,<slot number>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). slot number = **0** = No Video Fill (**Video Off**) **1 - 4** = Video Fill (**Video On**) Example: `SEND_COMMAND Panel,"'^BOS-500,1,0'"` Sets the button to display no video fill. Example: `SEND_COMMAND Panel,"'^BOS-500,1,2'"` Sets the button to display video in Slot 2. Refer to the *Video Settings Page* section on page 54 for more information on the slot assignments within a panel.
^BPP Set or clear the protected page flip flag of a button.	A value of zero (0) clears the flag. Syntax: `"'^BPP-<vt addr range>,<protected page flip flag value>'"` Variable: variable text address range = 1 - 4000. protected page flip flag value range = 0 - 4 (**0 clears the flag**). Example: `SEND_COMMAND Panel,"'^BPP-500,1'"` Sets the button to protected page flip flag 1 (sets it to password 1).

"^" Button Commands (Cont.)

^BRD Set the border of a button state/ states.	This command works **only if** the specified border is not the same as the current border. The border names are available through the TPDesign4 border-name drop-down list. Syntax: `"'^BRD-<vt addr range>,<button states range>,<border name>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). border name = Refer to the Border styles table on page 84. Example: `SEND_COMMAND Panel,"'^BRD-500.504&510.515,1&2,Quad Line'"` Sets the border by name (Quad Line) to those buttons with the variable text range of 500-504 & 510-515. Refer to the TPD4 Border Styles by Name table on page 84.
^BSF Set the focus to the text area.	**Note**: Select one button at a time (single variable text address). Do not assign a variable text address range to set focus to multiple buttons. Only one variable text address can be in focus at a time. Syntax: `"'^BSF-<vt addr>,<selection value>'"` Variable: variable text address = 1 - 4000. selection value = unselect = 0 and select = 1. Example: `SEND_COMMAND Panel,"'^BSF-500,1'"` Sets the focus to the text area of the button.
^BSM Submit text for text area buttons.	This command causes the text areas to send their text as strings to the NetLinx Master. Syntax: `"'^BSM-<vt addr range>'"` Variable: variable text address range = 1 - 4000. Example: `SEND_COMMAND Panel,"'^BSM-500'"` Submits the text of the text area button.
^BSO Set the sound played when a button is pressed.	If the sound name is blank the sound is then cleared. If the sound name is not matched, the button sound is not changed. Syntax: `"'^BSO-<vt addr range>,<button states range>,<sound name>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). sound name = (**blank** - sound cleared, **not matched** - button sound not changed). Example: `SEND_COMMAND Panel,"'^BSO-500,1&2,music.wav'"` Assigns the sound 'music.wav' to the button Off/On states.

"^" Button Commands (Cont.)

^BVL Log-On/Log-Off the computer control connection.	Syntax: `"'^BVL-<vt addr range>,<connection>'"` Variable: variable text address range = 1 - 4000. connection = 0 (Log-Off connection) and 1 (Log-On connection). Example: `SEND_COMMAND Panel,"'^BVL-500,0'"` Logs-off the computer control connection of the button.
^BVN Set the network name for the specified address.	Syntax: `"'^BVN-<vt addr range>,<network name>'"` Variable: variable text address range = 1 - 4000. network name = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^BVN-500,191.191.191.191'"` Sets the network name to '191.191.191.191' for the specific control button.
^BVP Set the network password for the specified address.	Syntax: `"'^BVP-<vt addr range>,<network password>'"` Variable: variable text address range = 1 - 4000. network password = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^BVP-500,PCLOCK'"` Sets the password to PCLOCK for the specific PC control button.
^BVT Set the computer control network port for the specified address.	Syntax: `"'^BVT-<vt addr range>,<network port>'"` Variable: variable text address range = 1 - 4000. network port = 1 - 65535. Example: `SEND_COMMAND Panel,"'^BVT-500,5000'"` Sets the network port to 5000.
^BWW Set the button word wrap feature to those buttons with a defined address range.	By default, word-wrap is Off. Syntax: `"'^BWW-<vt addr range>,<button states range>,<word wrap>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). word wrap = (0=Off and 1=On). Default is Off. Example: `SEND_COMMAND Panel,"'^BWW-500,1,1'"` Sets the word wrap on for the button's Off state.

"^" Button Commands (Cont.)

^CPF Clear all page flips from a button.	Syntax: `"'^CPF-<vt addr range>'"` Variable: variable text address range = 1 - 4000. Example: `SEND_COMMAND Panel,"'^CPF-500'"` Clears all page flips from the button.
^DPF Delete page flips from button if it already exists.	Syntax: `"'^DFP-<vt addr range>,<actions>,<page name>'"` Variable: variable text address range = 1 - 4000. actions = **Stan**[dardPage] - Flip to standard page **Prev**[iousPage] - Flip to previous page **Show**[Popup] - Show Popup page **Hide**[Popup] - Hide Popup page **Togg**[lePopup] - Toggle popup state **ClearG**[roup] - Clear popup page group from all pages **ClearP**[age] - Clear all popup pages from a page with the specified page name **ClearA**[ll] - Clear all popup pages from all pages page name = 1 - 50 ASCII characters. Example: `SEND COMMAND Panel,"'^DPF-409,Prev'"` Deletes the assignment of a button from flipping to a previous page.
^ENA Enable or disable buttons with a set variable text range.	Syntax: `"'^ENA-<vt addr range>,<command value>'"` Variable: variable text address range = 1 - 4000. command value = (0= disable, 1= enable) Example: `SEND_COMMAND Panel,"'^ENA-500.504&510.515,0'"` Disables button pushes on buttons with variable text range 500-504 & 510-515.
^FON Set a font to a specific Font ID value for those buttons with a defined address range.	Font ID numbers are generated by the TPDesign4 programmers report. Syntax: `"'^FON-<vt addr range>,<button states range>,<font value>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). font value = range = 1 - XXX. Refer to the Default Font Styles and ID Numbers table on page 83. Example: `SEND_COMMAND Panel,"'^FON-500.504&510.515,1&2,4'"` Sets the font size to font ID #4 for the on and off states of buttons with the variable text range of 500-504 & 510-515.

NOTE

The Font ID is generated by TPD4 and is located in TPD4 through the Main menu. ***Panel > Generate Programmer's Report >Text Only Format >Readme.txt****.*

"^" Button Commands (Cont.)	
^GDI Change the bargraph drag increment.	Syntax: "'^GDI-<vt addr range>,<bargraph drag increment>'" Variable: variable text address range = 1 - 4000. bargraph drag increment = The default drag increment is 256. Example: SEND_COMMAND Panel,"'^GDI-7,128'" Sets the bargraph with variable text 7 to a drag increment of 128.
^GIV Invert the joystick axis to move the origin to another corner.	Parameters 1, 2, and 3 will cause a bargraph or slider to be inverted regardless of orientation. Their effect will be as described for joysticks. Syntax: "'^GIV-<vt addr range>,<joystick axis to invert>'" Variable: variable text address range = 1 - 4000. joystick axis to invert = 0 - 3. 0 1 2 3 0 = Normal 1 = Invert horizontal axis 2 = Invert vertical axis 3 = Invert both axis locations For a bargraph 1 = Invert , 0 = Non Invert Example: SEND_COMMAND Panel,"'^GIV-500,3'" Inverts the joystick axis origin to the bottom right corner.
^GLH Change the bargraph upper limit.	Syntax: "'^GLH-<vt addr range>,<bargraph hi>'" Variable: variable text address range = 1 - 4000. bargraph limit range = 0 - 65535 (*bargraph upper limit range*). Example: SEND_COMMAND Panel,"'^GLH-500,1000'" Changes the bargraph upper limit to 1000.
^GLL Change the bargraph lower limit.	Syntax: "'^GLL-<vt addr range>,<bargraph low>'" Variable: variable text address range = 1 - 4000. bargraph limit range = 0 - 65535 (*bargraph lower limit range*). Example: SEND_COMMAND Panel,"'^GLL-500,150'" Changes the bargraph lower limit to 150.

<table>
<tr><th colspan="2">"^" Button Commands (Cont.)</th></tr>
<tr><td>^GRD
Change the bargraph ramp-down time in 1/10th of a second.</td><td>Syntax:
"'^GRD-<vt addr range>,<bargraph ramp down time>'"
Variable:
variable text address range = 1 - 4000.
bargraph ramp down time = in 1/10th of a second intervals.
Example:
SEND_COMMAND Panel,"'^GRD-500,200'"
Changes the bargraph ramp down time to 20 seconds.</td></tr>
<tr><td>^GRU
Change the bargraph ramp-up time in 1/10th of a second.</td><td>Syntax:
"'^GRU-<vt addr range>,<bargraph ramp up time>'"
Variable:
variable text address range = 1 - 4000.
bargraph ramp up time = in 1/10th of a second intervals.
Example:
SEND_COMMAND Panel,"'^GRU-500,100'"
Changes the bargraph ramp up time to 10 seconds.</td></tr>
<tr><td>^GSC
Change the bargraph slider color or joystick cursor color.</td><td>A user can also assign the color by color index, name, and R,G,B value (RRGGBB or RRGGBBAA).
Syntax:
"'^GSC-<vt addr range>,<color value>'"
Variable:
variable text address range = 1 - 4000.
color value = Refer to theRGB Values for all 88 Basic Colors table on page 81.
Example:
SEND_COMMAND Panel,"'^GSC-500,12'"
Changes the bargraph or joystick slider color to Yellow.</td></tr>
<tr><td>^GSN
Change the bargraph slider name or joystick cursor name.</td><td>Slider names and cursor names can be found in the TPDesign4 slider name and cursor drop-down list.
Syntax:
"'^GSN-<vt addr range>,<bargraph slider name>'"
Variable:
variable text address range = 1 - 4000.
bargraph slider name = see table below.
<table><tr><td colspan="3">Bargraph Slider Names:</td></tr><tr><td>None</td><td>Ball</td><td>Circle -L</td></tr><tr><td>Circle -M</td><td>Circle -S</td><td>Precision</td></tr><tr><td>Rectangle -L</td><td>Rectangle -M</td><td>Rectangle -S</td></tr><tr><td>Windows</td><td>Windows Active</td><td></td></tr><tr><td colspan="3">Joystick Cursor Names:</td></tr><tr><td>None</td><td>Arrow</td><td>Ball</td></tr><tr><td>Circle</td><td>Crosshairs</td><td>Gunsight</td></tr><tr><td>Hand</td><td>Metal</td><td>Spiral</td></tr><tr><td>Target</td><td>View Finder</td><td></td></tr></table>Example:
SEND_COMMAND Panel,"'^GSN-500,Ball'"
Changes the bargraph slider name or the Joystick cursor name to 'Ball'.</td></tr>
</table>

"^" Button Commands (Cont.)	
^ICO Set the icon to a button.	Syntax: `"'^ICO-<vt addr range>,<button states range>,<icon index>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). icon index range = 0 - 9900 (**a value of 0 is clear**). Example: `SEND_COMMAND Panel,"'^ICO-500.504&510.515,1&2,1'"` Sets the icon for On and Off states for buttons with variable text ranges of 500-504 & 510-515.
^JSB Set bitmap/ picture alignment using a numeric keypad layout for those buttons with a defined address range.	The alignment of 0 is followed by ',<left>,<top>'. The left and top coordinates are relative to the upper left corner of the button. Syntax: `"'^JSB-<vt addr range>,<button states range>,<new text alignment>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). new text alignment = Value of 1- 9 corresponds to the following locations: 0 1 2 3 4 5 6 7 8 9 Zero can be used for an absolute position Example: `SEND_COMMAND Panel,"'^JSB-500.504&510.515,1&2,1'"` Sets the off/on state picture alignment to upper left corner for those buttons with variable text ranges of 500-504 & 510-515.
^JSI Set icon alignment using a numeric keypad layout for those buttons with a defined address range.	The alignment of 0 is followed by ',<left>,<top>'. The left and top coordinates are relative to the upper left corner of the button. Syntax: `"'^JSI-<vt addr range>,<button states range>,<new icon alignment>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). new icon alignment = Value of 1 - 9 corresponds to the following locations: 0 1 2 3 4 5 6 7 8 9 Zero can be used for an absolute position Example: `SEND_COMMAND Panel,"'^JSI-500.504&510.515,1&2,1'"` Sets the Off/On state icon alignment to upper left corner for those buttons with variable text range of 500-504 & 510-515.

<table>
<tr><th colspan="2">"^" Button Commands (Cont.)</th></tr>
<tr><td>^JST
Set text alignment using a numeric keypad layout for those buttons with a defined address range.</td><td>The alignment of 0 is followed by ',<left>,<top>'. The left and top coordinates are relative to the upper left corner of the button.
Syntax:
<code>"'^JST-<vt addr range>,<button states range>,<new text alignment>'"</code>
Variable:
variable text address range = 1 - 4000.
button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state).
new text alignment = Value of 1 - 9 corresponds to the following locations:
0
<table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td>9</td></tr></table>Zero can be used for an absolute position
Example:
<code>SEND_COMMAND Panel,"'^JST-500.504&510.515,1&2,1'"</code>
Sets the text alignment to the upper left corner for those buttons with variable text ranges of 500-504 & 510-515.</td></tr>
<tr><td>^MBT
Set the Mouse Button mode On for the virtual PC.</td><td>Syntax:
<code>"'^MBT-<pass data>'"</code>
Variable:
pass data:
0 = None
1 = Left
2 = Right
3 = Middle
Example:
<code>SEND COMMAND Panel,"'^MBT-1'"</code>
Sets the mouse button mode to 'Left Mouse Click'.</td></tr>
<tr><td>^MDC
Turn On the 'Mouse double-click' feature for the virtual PC.</td><td>Syntax:
<code>"'^MDC'"</code>
Example:
<code>SEND COMMAND Panel,"'^MDC'"</code>
Sets the mouse double-click for use with the virtual PC.</td></tr>
<tr><td>^SHO
Show or hide a button with a set variable text range.</td><td>Syntax:
<code>"'^SHO-<vt addr range>,<command value>'"</code>
Variable:
variable text address range = 1 - 4000.
command value = (0= hide, 1= show).
Example:
<code>SEND_COMMAND Panel,"'^SHO-500.504&510.515,0'"</code>
Hides buttons with variable text address range 500-504 & 510-515.</td></tr>
</table>

"^" Button Commands (Cont.)	
^TEC Set the text effect color for the specified addresses/states to the specified color.	The Text Effect is specified by name and can be found in TPD4. You can also assign the color by name or RGB value (RRGGBB or RRGGBBAA). Syntax: `"'^TEC-<vt addr range>,<button states range>,<color value>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). color value = Refer to the RGB Values for all 88 Basic Colors table on page 81. Example: `SEND_COMMAND Panel,"'^TEC-500.504&510.515,1&2,12'"` Sets the text effect color to Very Light Yellow on buttons with variable text 500-504 and 510-515.
^TEF Set the text effect.	The Text Effect is specified by name and can be found in TPD4. Syntax: `"'^TEF-<vt addr range>,<button states range>,<text effect name>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). text effect name = Refer to the Text Effect Names table on page 106 for a listing of text effect names. Example: `SEND_COMMAND Panel,"'^TEF-500.504&510.515,1&2,Soft Drop Shadow 3'"` Sets the text effect to Soft Drop Shadow 3 for the button with variable text range 500-504 and 510-515.
^TXT Assign a text string to those buttons with a defined address range.	Sets Non-Unicode text. Syntax: `"'^TXT-<vt addr range>,<button states range>,<new text>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). new text = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^TXT-500.504&510.515,1&2,Test Only'"` Sets the On and Off state text for buttons with the variable text ranges of 500-504 and 510-515.

"^" Button Commands (Cont.)	
^UNI Set Unicode text.	For the ^UNI command (%UN and ^BMF command), the Unicode text is sent as ASCII-HEX nibbles. Syntax: `"'^UNI-<vt addr range>,<button states range>,<unicode text>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). unicode text = Unicode HEX value. Example: `SEND_COMMAND Panel,"'^UNI-500,1,0041'"` Sets the button's unicode character to 'A'. ***Note**: To send the variable text 'A' in unicode to all states of the variable text button 1, (for which the character code is 0041 Hex), send the following command:* `SEND_COMMAND TP,"'^UNI-1,0,0041'"` ***Note***: Unicode is always represented in a HEX value. TPD4 generates (through the Text Enter Box dialog box) unicode HEX values. Refer to the TPDesign4 Instruction Manual for more information.

Text Effect Names

The following is a listing of text effects names. This list is associated with the **^TEF** command on page 104.

Text Effect Names	
• Glow -S	• Hard Drop Shadow 6
• Glow -M	• Hard Drop Shadow 7
• Glow -L	• Hard Drop Shadow 8
• Glow -X	• Soft Drop Shadow 1 with outline
• Outline -S	• Soft Drop Shadow 2 with outline
• Outline -M	• Soft Drop Shadow 3 with outline
• Outline -L	• Soft Drop Shadow 4 with outline
• Outline -X	• Soft Drop Shadow 5 with outline
• Soft Drop Shadow 1	• Soft Drop Shadow 6 with outline
• Soft Drop Shadow 2	• Soft Drop Shadow 7 with outline
• Soft Drop Shadow 3	• Soft Drop Shadow 8 with outline
• Soft Drop Shadow 4	• Medium Drop Shadow 1 with outline
• Soft Drop Shadow 5	• Medium Drop Shadow 2 with outline
• Soft Drop Shadow 6	• Medium Drop Shadow 3 with outline
• Soft Drop Shadow 7	• Medium Drop Shadow 4 with outline
• Soft Drop Shadow 8	• Medium Drop Shadow 5 with outline
• Medium Drop Shadow 1	• Medium Drop Shadow 6 with outline
• Medium Drop Shadow 2	• Medium Drop Shadow 7 with outline
• Medium Drop Shadow 3	• Medium Drop Shadow 8 with outline
• Medium Drop Shadow 4	• Hard Drop Shadow 1 with outline
• Medium Drop Shadow 5	• Hard Drop Shadow 2 with outline
• Medium Drop Shadow 6	• Hard Drop Shadow 3 with outline
• Medium Drop Shadow 7	• Hard Drop Shadow 4 with outline
• Medium Drop Shadow 8	• Hard Drop Shadow 5 with outline
• Hard Drop Shadow 1	• Hard Drop Shadow 6 with outline
• Hard Drop Shadow 2	• Hard Drop Shadow 7 with outline
• Hard Drop Shadow 3	• Hard Drop Shadow 8 with outline
• Hard Drop Shadow 4	
• Hard Drop Shadow 5	

Button Query Commands

Button Query commands reply back with a custom event. There will be one custom event for each button/state combination. Each query is assigned a unique custom event type. **The following example is for debug purposes only:**

```
NetLinx Example: CUSTOM_EVENT[device, Address, Custom event type]
```

DEFINE_EVENT

```
CUSTOM_EVENT[TP,529,1001]       // Text
CUSTOM_EVENT[TP,529,1002]       // Bitmap
CUSTOM_EVENT[TP,529,1003]       // Icon
CUSTOM_EVENT[TP,529,1004]       // Text Justification
CUSTOM_EVENT[TP,529,1005]       // Bitmap Justification
CUSTOM_EVENT[TP,529,1006]       // Icon Justification
CUSTOM_EVENT[TP,529,1007]       // Font
CUSTOM_EVENT[TP,529,1008]       // Text Effect Name
CUSTOM_EVENT[TP,529,1009]       // Text Effect Color
CUSTOM_EVENT[TP,529,1010]       // Word Wrap
CUSTOM_EVENT[TP,529,1011]       // ON state Border Color
CUSTOM_EVENT[TP,529,1012]       // ON state Fill Color
CUSTOM_EVENT[TP,529,1013]       // ON state Text Color
CUSTOM_EVENT[TP,529,1014]       // Border Name
CUSTOM_EVENT[TP,529,1015]       // Opacity
```

```
{
   Send_String 0,"'ButtonGet Id=',ITOA(CUSTOM.ID),' Type=',ITOA(CUSTOM.TYPE)"
   Send_String 0,"'Flag   =',ITOA(CUSTOM.FLAG)"
   Send_String 0,"'VALUE1 =',ITOA(CUSTOM.VALUE1)"
   Send_String 0,"'VALUE2 =',ITOA(CUSTOM.VALUE2)"
   Send_String 0,"'VALUE3 =',ITOA(CUSTOM.VALUE3)"
   Send_String 0,"'TEXT   =',CUSTOM.TEXT"
   Send_String 0,"'TEXT LENGTH =',ITOA(LENGTH_STRING(CUSTOM.TEXT))"
}
```

All custom events have the following 6 fields:

Custom Event Fields	
Field	Description
Uint Flag	0 means text is a standard string, 1 means Unicode encoded string
slong value1	button state number
slong value2	actual length of string (this is not encoded size)
slong value3	index of first character (usually 1 or same as optional index
string text	the text from the button
text length (string encode)	button text length

These fields are populated differently for each query command. The text length (String Encode) field is not used in any command.

Button Query Commands	
?BCB Get the current border color.	Syntax: `"'?BCB-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1011:** Flag - zero Value1 - Button state number Value2 - Actual length of string (should be 9) Value3 - Zero Text - Hex encoded color value (ex: #000000FF) Text length - Color name length (should be 9) Example: `SEND COMMAND Panel,"'?BCB-529,1'"` Gets the button 'OFF state' border color. information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1011 Flag = 0 VALUE1 = 1 VALUE2 = 9 VALUE3 = 0 TEXT = #222222FF TEXT LENGTH = 9

Button Query Commands (Cont.)	
?BCF Get the current fill color.	Syntax: `"'?BCF-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1012:** Flag - Zero Value1 - Button state number Value2 - Actual length of string (should be 9) Value3 - Zero Text - Hex encoded color value (ex: #000000FF) Text length - Color name length (should be 9) Example: `SEND COMMAND Panel,"'?BCF-529,1'"` Gets the button 'OFF state' fill color information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1012 Flag = 0 VALUE1 = 1 VALUE2 = 9 VALUE3 = 0 TEXT = #FF8000FF TEXT LENGTH = 9
?BCT Get the current text color.	Syntax: `"'?BCT-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1013:** Flag - Zero Value1 - Button state number Value2 - Actual length of string (should be 9) Value3 - Zero Text - Hex encoded color value (ex: #000000FF) Text length - Color name length (should be 9) Example: `SEND COMMAND Panel,"'?BCT-529,1'"` Gets the button 'OFF state' text color information. The result sent to Master would be: ButtonGet Id = 529 Type = 1013 Flag = 0 VALUE1 = 1 VALUE2 = 9 VALUE3 = 0 TEXT = #FFFFFEFF TEXT LENGTH = 9

Button Query Commands (Cont.)	
?BMP Get the current bitmap name.	Syntax: `"'?BMP-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1002:** Flag - Zero Value1 - Button state number Value2 - Actual length of string Value3 - Zero Text - String that represents the bitmap name Text length - Bitmap name text length (should be 9) Example: `SEND COMMAND Panel,"'?BMP-529,1'"` Gets the button 'OFF state' bitmap information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1002 Flag = 0 VALUE1 = 1 VALUE2 = 9 VALUE3 = 0 TEXT = Buggs.png TEXT LENGTH = 9
?BOP Get the overall button opacity.	Syntax: `"'?BOP-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1015:** Flag - Zero Value1 - Button state number Value2 - Opacity Value3 - Zero Text - Blank Text length - Zero Example: `SEND COMMAND Panel,"'?BOP-529,1'"` Gets the button 'OFF state' opacity information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1015 Flag = 0 VALUE1 = 1 VALUE2 = 200 VALUE3 = 0 TEXT = TEXT LENGTH = 0

Button Query Commands (Cont.)	
?BRD Get the current border name.	Syntax: `"'?BRD-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1014:** Flag - Zero Value1 - Button state number Value2 - Actual length of string Value3 - Zero Text - String that represents border name Text length - Border name length Example: `SEND COMMAND Panel,"'?BRD-529,1'"` Gets the button 'OFF state' border information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1014 Flag = 0 VALUE1 = 1 VALUE2 = 22 VALUE3 = 0 TEXT = Double Bevel Raised -L TEXT LENGTH = 22
?BWW Get the current word wrap flag status.	Syntax: `"'?BWW-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1010:** Flag - Zero Value1 - Button state number Value2 - 0 = no word wrap, 1 = word wrap Value3 - Zero Text - Blank Text length - Zero Example: `SEND COMMAND Panel,"'?BWW-529,1'"` Gets the button 'OFF state' word wrap flag status information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1010 Flag = 0 VALUE1 = 1 VALUE2 = 1 VALUE3 = 0 TEXT = TEXT LENGTH = 0

Button Query Commands (Cont.)	
?FON Get the current font index.	Syntax: "'?FON-<vt addr range>,<button states range>'" Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1007:** Flag - Zero Value1 - Button state number Value2 - Font index Value3 - Zero Text - Blank Text length - Zero Example: SEND COMMAND Panel,"'?FON-529,1'" Gets the button 'OFF state' font type index information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1007 Flag = 0 VALUE1 = 1 VALUE2 = 72 VALUE3 = 0 TEXT = TEXT LENGTH = 0
?ICO Get the current icon index.	Syntax: "'?ICO-<vt addr range>,<button states range>'" Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1003:** Flag - Zero Value1 - Button state number Value2 - Icon Index Value3 - Zero Text - Blank Text length - Zero Example: SEND COMMAND Panel,"'?ICO-529,1&2'" Gets the button 'OFF state' icon index information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1003 Flag = 0 VALUE1 = 2 VALUE2 = 12 VALUE3 = 0 TEXT = TEXT LENGTH = 0

Button Query Commands (Cont.)	
?JSB Get the current bitmap justification.	Syntax: `"'?JSB-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1005:** Flag - Zero Value1 - Button state number Value2 - 1 - 9 justify Value3 - Zero Text - Blank Text length - Zero Example: `SEND COMMAND Panel,"'?JSB-529,1'"` Gets the button 'OFF state' bitmap justification information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1005 Flag = 0 VALUE1 = 1 VALUE2 = 5 VALUE3 = 0 TEXT = TEXT LENGTH = 0
?JSI Get the current icon justification.	Syntax: `"'?JSI-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1006:** Flag - Zero Value1 - Button state number Value2 - 1 - 9 justify Value3 - Zero Text - Blank Text length - Zero Example: `SEND COMMAND Panel,"'?JSI-529,1'"` Gets the button 'OFF state' icon justification information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1006 Flag = 0 VALUE1 = 1 VALUE2 = 6 VALUE3 = 0 TEXT = TEXT LENGTH = 0

Button Query Commands (Cont.)	
?JST Get the current text justification.	Syntax: `"'?JST-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1004:** Flag - Zero Value1 - Button state number Value2 - 1 - 9 justify Value3 - Zero Text - Blank Text length - Zero Example: `SEND COMMAND Panel,"'?JST-529,1'"` Gets the button 'OFF state' text justification information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1004 Flag = 0 VALUE1 = 1 VALUE2 = 1 VALUE3 = 0 TEXT = TEXT LENGTH = 0
?TEC Get the current text effect color.	Syntax: `"'?TEC-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1009:** Flag - Zero Value1 - Button state number Value2 - Actual length of string (should be 9) Value3 - Zero Text - Hex encoded color value (ex: #000000FF) Text length - Color name length (should be 9) Example: `SEND COMMAND Panel,"'?TEC-529,1'"` Gets the button 'OFF state' text effect color information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1009 Flag = 0 VALUE1 = 1 VALUE2 = 9 VALUE3 = 0 TEXT = #5088F2AE TEXT LENGTH = 9

Button Query Commands (Cont.)	
?TEF Get the current text effect name.	Syntax: `"'?TEF-<vt addr range>,<button states range>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). custom event type **1008:** Flag - Zero Value1 - Button state number Value2 - Actual length of string Value3 - Zero Text - String that represents the text effect name Text length - Text effect name length Example: `SEND COMMAND Panel,"'?TEF-529,1'"` Gets the button 'OFF state' text effect name information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1008 Flag = 0 VALUE1 = 1 VALUE2 = 18 VALUE3 = 0 TEXT = Hard Drop Shadow 3 TEXT LENGTH = 18
?TXT Get the current text information.	Syntax: `"'?TXT-<vt addr range>,<button states range>,<optional index>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). optional index = This is used if a string was too long to get back in one command. The reply will start at this index. custom event type **1001:** Flag - Zero Value1 - Button state number Value2 - Actual length of string Value3 - Index Text - Text from the button Text length - Button text length Example: `SEND COMMAND Panel,"'?TXT-529,1'"` Gets the button 'OFF state' text information. The result sent to the Master would be: ButtonGet Id = 529 Type = 1001 Flag = 0 VALUE1 = 1 VALUE2 = 14 VALUE3 = 1 TEXT = This is a test TEXT LENGTH = 14

Panel Runtime Operations

Serial Commands are used in the AxcessX Terminal Emulator mode. These commands are not case sensitive.

Panel Runtime Operation Commands	
ABEEP Output a single beep even if beep is Off.	Syntax: `"'ABEEP'"` Example: `SEND COMMAND Panel,"'ABEEP'"` Outputs a beep of duration 1 beep even if beep is Off.
ADBEEP Output a double beep even if beep is Off.	Syntax: `"'ADBEEP'"` Example: `SEND COMMAND Panel,"'ADBEEP'"` Outputs a double beep even if beep is Off.
@AKB Pop up the keyboard icon and initialize the text string to that specified.	Keyboard string is set to null on power up and is stored until power is lost. The Prompt Text is optional. Syntax: `"'@AKB-<initial text>;<prompt text>'"` Variables: `initial text = 1 - 50 ASCII characters.` `prompt text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'@AKB-Texas;Enter State'"` Pops up the Keyboard and initializes the text string 'Texas' with prompt text 'Enter State'.
AKEYB Pop up the keyboard icon and initializes the text string to that specified.	Keyboard string is set to null on power up and is stored until power is lost. Syntax: `"'AKEYB-<initial text>'"` Variables: `initial text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'AKEYB-This is a Test'"` Pops up the Keyboard and initializes the text string 'This is a Test'.
AKEYP Pop up the keypad icon and initialize the text string to that specified.	The keypad string is set to null on power up and is stored until power is lost. Syntax: `"'AKEYP-<number string>'"` Variables: `number string = 0 - 9999.` Example: `SEND COMMAND Panel,"'AKEP-12345'"` Pops up the Keypad and initializes the text string '12345'.
AKEYR Remove the Keyboard/ Keypad.	Remove keyboard or keypad that was displayed using 'AKEYB', 'AKEYP', 'PKEYP', @AKB, @AKP, @PKP, @EKP, or @TKP commands. Syntax: `"'AKEYR'"` Example: `SEND COMMAND Panel,"'AKEYR'"` Removes the Keyboard/Keypad.

Panel Runtime Operation Commands (Cont.)	
@AKP Pop up the keypad icon and initialize the text string to that specified.	Keypad string is set to null on power up and is stored until power is lost. The Prompt Text is optional. Syntax: `"'@AKP-<initial text>;<prompt text>'"` Variables: `initial text = 1 - 50 ASCII characters.` `prompt text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'@AKP-12345678;ENTER PASSWORD'"` Pops up the Keypad and initializes the text string '12345678' with prompt text 'ENTER PASSWORD'.
@AKR Remove the Keyboard/ Keypad.	Remove keyboard or keypad that was displayed using 'AKEYB', 'AKEYP', 'PKEYP', @AKB, @AKP, @PKP, @EKP, or @TKP commands. Syntax: `"'@AKR'"` Example: `SEND COMMAND Panel,"'@AKR'"` Removes the Keyboard/Keypad.
BEEP Output a beep.	Syntax: `"'BEEP'"` Example: `SEND COMMAND Panel,"'BEEP'"` Outputs a beep.
DBEEP Output a double beep.	Syntax: `"'DBEEP'"` Example: `SEND COMMAND Panel,"'DBEEP'"` Outputs a double beep.
@EKP Extend the Keypad.	Pops up the keypad icon and initializes the text string to that specified. The Prompt Text is optional. Syntax: `"'@EKP-<initial text>;<prompt text>'"` Variables: `initial text = 1 - 50 ASCII characters.` `prompt text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'@EKP-33333333;Enter Password'"` Pops up the Keypad and initializes the text string '33333333' with prompt text 'Enter Password'.

Panel Runtime Operation Commands (Cont.)	
PKEYP Present a private keypad.	Pops up the keypad icon and initializes the text string to that specified. Keypad displays a '*' instead of the numbers typed. The Prompt Text is optional. Syntax: `"'PKEYP-<initial text>'"` Variables: `initial text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'PKEYP-123456789'"` Pops up the Keypad and initializes the text string '123456789' in '*'.
@PKP Present a private keypad.	Pops up the keypad icon and initializes the text string to that specified. Keypad displays a '*' instead of the numbers typed. The Prompt Text is optional. Syntax: `"'@PKP-<initial text>;<prompt text>'"` Variables: `initial text = 1 - 50 ASCII characters.` `prompt text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'@PKP-1234567;ENTER PASSWORD'"` Pops up the Keypad and initializes the text string 'ENTER PASSWORD' in '*'.
SETUP Send panel to Setup page.	Syntax: `"'SETUP'"` Example: `SEND COMMAND Panel,"'SETUP'"` Sends the panel to the Setup Page.
SLEEP Force the panel into screen saver mode.	Syntax: `"'SLEEP'"` Example: `SEND COMMAND Panel,"'SLEEP'"` Forces the panel into screen saver mode.
@SOU Play a sound file.	Syntax: `"'@SOU-<sound name>'"` Variables: `sound name = Name of the sound file. Supported sound file formats are: WAV & MP3.` Example: `SEND COMMAND Panel,"'@SOU-Music.wav'"` Plays the 'Music.wav' file.

Panel Runtime Operation Commands (Cont.)	
@TKP Present a telephone keypad.	Pops up the keypad icon and initializes the text string to that specified. The Prompt Text is optional. Syntax: `"'@TKP-<initial text>;<prompt text>'"` Variables: `initial text = 1 - 50 ASCII characters.` `prompt text = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'@TKP-999.222.1211;Enter Phone Number'"` Pops-up the Keypad and initializes the text string '999.222.1211' with prompt text 'Enter Phone Number'.
TPAGEOFF Turn off page tracking.	Syntax: `"'TPAGEOFF'"` Example: `SEND COMMAND Panel,"'TPAGEOFF'"` Turns off page tracking.
TPAGEON Turn on page tracking.	This command turns on page tracking, whereby when the page or popups change, a string is sent to the Master. This string may be captured with a CREATE_BUFFER command for one panel and sent directly to another panel. Syntax: `"'TPAGEON'"` Example: `SEND COMMAND Panel,"'TPAGEON'"` Turns on page tracking.
@VKB Popup the virtual keyboard.	Syntax: `"'@VKB'"` Example: `SEND COMMAND Panel,"'@VKB'"` Pops-up the virtual keyboard.
WAKE Force the panel out of screen saver mode.	Syntax: `"'WAKE'"` Example: `SEND COMMAND Panel,"'WAKE'"` Forces the panel out of the screen saver mode.

Input Commands

These Send Commands are not case sensitive.

Input Commands	
^CAL Put panel in calibration mode.	Syntax: `"'^CAL'"` Example: `SEND COMMAND Panel,"'^CAL'"` Puts the panel in calibration mode.
^PPS Set the pass-thru for a selected source input.	Sets the USB port pass-thru, including mouse, keyboard and touch. 0 means pass data to G4 app. 1-4 pass the data out through the corresponding source input port. The command can only be used AFTER the HUB has been recognized and enumerated by the remote PC. **Note:** The ^PPS command replaces the separate ^MPS and ^KPS commands that were used on the TPI-4 Syntax: `"'^PPS-<pass data>'"` Variable: **pass data**: <blank/empty> = Disables the pass-thru feature for the selected source input. 0 = Pass data to G4 application (default). 1 - 4 = Pass data out to the respective source input. Example: `SEND_COMMAND Panel,"'^PPS-1'"` Sends mouse, keyboard, and touch input data out through USB pass-thru port 1.
^SLT Send a command to a given slot.	Send a command to a given card slot. At the moment, these commands are directed at the video card subsystems. Not all commands are supported by all products. The following is a list of commands targeted to this subsystem. Syntax: `"'^SLT-<slot number>,<slot command>'"` Variables: slot number = 1 - 4 (each of these options corresponds to a TPI-PRO source input position.) Slot 1 = source input position 1. Slot 2 = source input position 2. Slot 3 = source input position 3. Slot 4 = source input position 4. slot command = *<header> = <value> [repeat]* Slot commands will contain a series of name/value pairs separated by commas. Input = <Comp, SVideo, Component, Comp1, Comp2, Comp3, RGB> where: **Comp** = Composite video input (not used on the TPI-PRO), **SVideo** = SVideo input, **Component** = Component video input, **Comp1**, **Comp2**, **Comp3** = composite 1, composite 2, or composite 3 **RGB** = RGB/VGA computer input Example: `SEND_COMMAND Panel,"'^SLT-1,Input=Component'"` Sets the Slot 1 video input to accept a Component video signal.

Input Commands (Cont.)	
^TPO Sets the display for G4 graphics.	Selects which of the 2 outputs display G4 graphics. Syntax: `SEND_COMMAND <DEV>,"'^TPO-<Output Value>'"` Variable: Output Value: 0 - None (should not be used in a typical installation) 1 - G4 Graphics on output 1 only 2 - G4 Graphics on output 2 only 3 - G4 Graphics on both outputs 1 and 2 (default) **Note:** Any G4 graphics that appear over a Video Window when the ^TPO Command is used to turn off G4 graphics on an output may leave a “hole” in the video display if the button opacity is too high. The upper limit of opacity for any graphic over a video window is panel design dependant. The more layers of graphics over a video window, the lower you need to set the opacity for the layers. A single layer of graphics has shown that an opacity value of 250 or lower is sufficient to correct the problem. Example: `SEND_COMMAND Panel,"'^TPO-3'"` Sets G4 Graphics on both outputs 1 & 2
^VKS Send one or more virtual keystrokes to the G4 application.	Key presses and key releases are not distinguished except in the case of CTRL, ALT, and SHIFT. **Refer to theEmbedded Codes table on page 121** that defines special characters which can be included with the string but may not be represented by the ASCII character set. Syntax: `"'^VKS-<string>'"` Variable: string = Only 1 string per command/only one stroke per command. Example: `SEND COMMAND Panel,"'^VKS-'8"` Sends out the keystroke 'backspace' to the G4 application.

Embedded Codes

The following is a list of G4 compatible embedded codes:

Embedded Codes		
Decimal numbers	Hexidecimal values	Virtual keystroke
8	($08)	Backspace
13	($0D)	Enter
27	($1B)	ESC
128	($80)	CTRL key down
129	($81)	ALT key down
130	($82)	Shift key down
131	($83)	F1
132	($84)	F2
133	($85)	F3
134	($86)	F4
135	($87)	F5
136	($88)	F6
137	($89)	F7
138	($8A)	F8

Embedded Codes (Cont.)		
Decimal numbers	Hexidecimal values	Virtual keystroke
139	($8B)	F9
140	($8C)	F10
141	($8D)	F11
142	($8E)	F12
143	($8F)	Num Lock
144	($90)	Caps Lock
145	($91)	Insert
146	($92)	Delete
147	($93)	Home
148	($94)	End
149	($95)	Page Up
150	($96)	Page Down
151	($97)	Scroll Lock
152	($98)	Pause
153	($99)	Break
154	($9A)	Print Screen
155	($9B)	SYSRQ
156	($9C)	Tab
157	($9D)	Windows
158	($9E)	Menu
159	($9F)	Up Arrow
160	($A0)	Down Arrow
161	($A1)	Left Arrow
162	($A2)	Right Arrow
192	($C0)	CTRL key up
193	($C1)	ALT key up
194	($C2)	Shift key up

Panel Setup Commands

These commands are not case sensitive.

Panel Setup Commands	
^MUT Set the panel mute state.	Syntax: `"'^MUT-<mute state>'"` Variable: mute state= 0 = Mute Off and 1 = Mute On. Example: `SEND_COMMAND Panel,"'^MUT-1'"` Sets the panel's master volume to mute.

Panel Setup Commands (Cont.)	
@PWD Set the page flip password.	@PWD sets the level 1 password only. Syntax: `"'@PWD-<page flip password>'"` Variables: `page flip password = 1 - 50 ASCII characters.` Example: `SEND COMMAND Panel,"'@PWD-Main'"` Sets the page flip password to 'Main'.
^PWD Set the page flip password.	Password level is required and must be 1 - 4. Syntax: `"'^PWD-<password level>,<page flip password>'"` Variables: `password level = 1 - 4.` page flip password = 1 - 50 ASCII characters. Example: `SEND COMMAND Panel,"'^PWD-1,Main'"` Sets the page flip password on Password Level 1 to 'Main'.
@RPP Reset the protected password.	@RPP resets the protected password to its default (1988). Syntax: `"'@RPP'"` Example: `SEND COMMAND Panel,"'@RPP'"` Resets the protected Setup page password to ‘1988’.
^VOL Set the panel volume.	Syntax: `"'^VOL-<volume level>'"` Variable: volume level = 0 - 100. ***100 is maximum volume setting.*** Example: `SEND_COMMAND Panel,"'^VOL-50'"` Set the panel volume to 50.

Dynamic Image Commands

The following is a listing and descriptions of Dynamic Image Commands.

Dynamic Image Commands	
^BBR Set the bitmap of a button to use a particular resource.	Syntax: `"'^BBR-<vt addr range>,<button states range>,<resource name>'"` Variable: variable text address range = 1 - 4000. button states range = 1 - 256 for multi-state buttons (0 = All states, for General buttons 1 = Off state and 2 = On state). resource name = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^BBR-700,1,Sports_Image'"` Sets the resource name of the button to 'Sports_Image'.
^RFR Force a refresh for a given resource.	Syntax: `"'^RFR-<resource name>'"` Variable: resource name = 1 - 50 ASCII characters. Example: `SEND_COMMAND Panel,"'^RFR-Sports_Image'"` Forces a refresh on 'Sports_Image'.
^RMF Modify an existing resource.	Syntax: `"'^RMF-<resource name>,<data>'"` Variable: resource name = 1 - 50 ASCII characters data = Refer to the table in the RAF command for more information. Example: `SEND_COMMAND Panel,"'^RMF-Sports_Image,%ALab_Test/Images%Ftest.jpg'"` Changes the resource 'Sports_Image' file name to 'test.jpg' and the path to 'Lab_Test/Images'.

Dynamic Image Commands (Cont.)

^RAF

Add new resources.

Adds any and all resource parameters by sending embedded codes and data.

Syntax:

```
"'^RAF-<resource name>,<data>'"
```

Variable:

resource name = 1 - 50 ASCII characters.

data = Refers to the embedded codes, see table below.

Embedded Codes:

Parameter	Embedded Code	Description
protocol	'%P<0-1>'	Set protocol. HTTP (0) or FTP (1)
user	'%U<user>'	Set Username for authentication.
password	'%S<password>'	Set Password for authentication.
host	'%H<host>'	Set Host Name (fully qualified DNS or IP Address).
file	'%F<file>'	Full path to the location of the file or program that will return the resource. The path must be a valid HTTP URL minus the protocol and host. The only exception to this is the inclusion of special escape sequences and in the case of the FTP protocol, regular expressions.
path	'%A<path>'	Set Directory path. The path must be a valid HTTP URL minus the protocol, host, and filename. The only exception to this is the inclusion of special escape sequences and in the case of the FTP protocol, regular expressions.
refresh	'%R<refresh 1-65535>'	The number of seconds between refreshes in which the resource is downloaded again. Refreshing a resource causes the button displaying that resource to refresh also. The default value is 0 (only download the resource once).
newest	'%N<0-1>'	Set the newest file. A value of 1 means that only the most recent file matching the pattern is downloaded.
preserve	'%V<0-1>'	Set the value of the preserve flag. Default is 0. Currently preserve has no function.

Example:

```
SEND_COMMAND Panel,"'^RAF-New Image,%P0%HAMX.COM%ALab/
Test_file%Ftest.jpg'"
```

Adds a new resource. The resource name is 'New Image', %P (protocol) is an HTTP, %H (host name) is ***AMX.COM***, %A (file path) is Lab/Test file, and %F (file name) is ***test.jpg***.

Dynamic Image Commands (Cont.)	
^RSR Change the refresh rate for a given resource.	Syntax: `"'^RSR-<resource name>,<refresh rate>'"` Variable: resource name = 1 - 50 ASCII characters. refresh rate = Measured in seconds. Example: `SEND_COMMAND Panel,"'^RSR-Sports_Image,5'"` Sets the refresh rate to 5 seconds for the given resource ('Sports_Image').

Listboxes

Listboxes provide flexibility to remote pages once constrained by physical display areas. Both static and dynamic tables can display multiple devices and items when used with proper navigation tools. List Box commands can be used in conjunction with the application *TPDesign4* to create both static and dynamic commands.

Any data field (including primary data) may be enclosed in double quotes so that commas within that data field will not be interpreted as delimiters. Within the double quotes in such a field, the backslash (\) is treated as an escape character so that double quote literals can still be used within the field. When a backslash is encountered, it is discarded and the following character is treated as a literal. This means that if a backslash is part of the data field, it needs to be escaped with a preceding backlash as well.

When a column or row number is required as a field in any command, note that the numbering begins at 1, not 0 (i.e. the first column is column 1 and the first row is row 1).

There are no hard limits enforced for the number of list boxes and such list box parameters as list address and column count. The range is determined by available memory, which is affected by things like how many lists are defined and how many items will be added for each list.

List Box Commands

The TPI-PRO supports the following Data List Box Commands.

List Box Commands	
Data List Commands	
^LDN Creates a new data list. Unique list addresses and names are handled programmatically.	It is up to the program to make sure the list address and name are unique. Syntax: `"'^LDN-<list port>,<list address>, <column count>,<list name>'"` Variables: • list port = 1-100. Port where data resides • list address = address where data resides • column count = the number of data columns (includes hidden columns) • list name = User specified name for the data list Example: `SEND_COMMAND Device, "'^LDN-5,1,4,my songs'"` Creates a data list of **4** columns named "**my songs**" and places it at port **5**, address **1**.
^LDA Adds a new row to an existing data list. Primary data is required.	Syntax: `SEND_COMMAND <DEV>,"'^LDA-<list address>,<uniflag>,<primary data>,<data2>…'"` Variables: • list address = address where data resides • uniflag = indicates unicode; 0 - No unicode, 1 - Uses unicode • primary data = the "key" data column. The information in this column provides each row with its uniqueness. • data2 = variable, column data information. The number of data fields is limited only to the number of columns in the data list. Example: `SEND_COMMAND Device,"'^LDA-1,0,Entry5,Meatloaf,Best of,Anything for Love'"` Adds a text row to the data list located at address 1. The primary data is set as Entry5. Meatloaf, Best of, and Anything for Love are all cells within the new row. Example (unicode): `SEND_COMMAND Device,"'^LDA-1,1,0045006E0074007200790035,004D006500610074006C006F00610061,004200650073007400200006F0066,0041006E0079007400680069006E006700200066006F00720020004C006F00760065'"` Adds a unicode text row to the data list located at address 1. The primary data is set as Entry5. Meatloaf, Best of, and Anything for Love are all cells within the new row.

List Box Commands (Cont.)	
Data List Commands	
^LDR Removes a row from an existing data list	Syntax: `SEND_COMMAND <DEV>,"'^LDR-<list address>,<uniflag>,<primary data>'"` Variables: • list address = address where data resides • uniflag = indicates unicode; 0 - No unicode, 1 - Uses unicode • primary data = the "key" data column. The information in this column provides each row with its uniqueness. Example: `SEND_COMMAND Device,"'^LDR-1,0,Entry5'"` Removes the text row with primary data Entry5 from an existing data list at address 1.
^LDC Clears all rows in a given list	Syntax: `"'^LDC-<list address>'"` Variables: • list address = address where data resides Example: `SEND_COMMAND Device, "'^LDC-1'"` Clears all rows in data list located at address **1**.
^LDD Deletes the data list	Syntax: `"'^LDD-<list address>'"` Variables: • list address = address where data resides Example: `SEND_COMMAND Device, "'^LDD-1'"` Deletes the data list located at address **1**.
^LDT Sets the column type for a data list	Set the column type for a data list by modifying its column type. Column is the index of the first type to set. Additional types sent will be set in this order: 0 - Text 1 - Reserved 2 - Reserved 3 - Channel 4 - Page Syntax: `SEND_COMMAND <DEV>,"'^LDT-<list address>,<column>,<type>,<type>…'"` Variables: • list address = address where data resides • column = the starting column number (first column is 1) • type = subsequent columns. 0 - Text; 3 - Channel; 4 - Page Example: `SEND_COMMAND Device,"'^LDT-1,1,0,0,0'"` Sets the column type for the data list located at address 1. The column type starts at column 1, the first column is Text, the second and third columns are also Text.

List Box Commands (Cont.)	
Data List Commands	
^LDL Modifies the data in a single column field	Modifies the data in a single column field. This can be used to load a data list that has long text fields. Syntax: `SEND_COMMAND <DEV>,"'^LDL-<list address>,<column>,<uniflag>,<primary data>,<data column>'"` Variables: • list address = address where data resides • column = the starting column number (first column is 1) • uniflag = indicates unicode; 0 - No unicode, 1 - Uses unicode • primary data = the "key" data column. The information in this column provides each row with its uniqueness. • new cell data = data information for a single field or "cell" Example: `SEND_COMMAND Device,"'^LDL-1,1,0,Entry5,Music'"` The field located in column 1, in the row with the primary data "Entry5" and in the data list located at the address of 1 is a text value of Music. Example (unicode): `SEND_COMMAND Device, "'^LDL-1,1,1,0045006E0074007200790035,004D0075007300690063'"` The field located in column 1, in the row with the primary data "Entry5" and in the data list located at the address of 1 is a text value of Music.
^LVC Set the table column display order according to the order of the entered column values	Set the table column display order according to the order of the entered column values. Syntax: `SEND_COMMAND <DEV>,"'^LVC-<view address>,<column>,<column>…'"` Variables: • view address = the address of the view definition • column = the column number to display (first column is 1) Example: `SEND_COMMAND Device,"'^LVC-3,5,2,1'"` Sets the column display order to column 5 first, then column 2, and then column 1. The data list is displayed according to the view definitions located at address 3.

List Box Commands (Cont.)	
List View Commands	
^LVF Filter a list by setting what column to use and what string to compare	Filter a list by setting what column to use and what string to compare. Note that setting column to zero or data to none makes the filtered ordering the same as sorted ordering. Update must be called for changes to take effect. Syntax: `SEND_COMMAND <DEV>,"'^LVF-<view address>,<uniflag>,<column>,<search data>'"` Variables: • view address = the address of the view definition • uniflag = indicates unicode; 0 - No unicode, 1 - Uses unicode • column = the starting column number (first column is 1) • search data = the data on which to filter Example: `SEND_COMMAND Device,"'LVF-1,0,2,Smith'"` Filters list based on column 2 such that only those rows whose column 2 contains Smith are displayed. The data is displayed according to the view definitions located at address 1. Filter is case sensitive.
^LVL Set the data list to be displayed	Set the data list to be displayed. Syntax: `SEND_COMMAND <DEV>,"'^LVL-<view address>,<list port>,<list address>'"` Variables: • view address = the address of the view definition • list port = 1-100. port where data resides • list address = address where data resides Example: `SEND_COMMAND Device,"'^LVL-5,my songs'"` Sets the data list viewed to my songs and displays it according to the view definitions located at address 5.

List Box Commands (Cont.)	
List View Commands	
^LVM Display a new position	Display a new position. If select is set, then select that new position. Syntax: `SEND_COMMAND <DEV>,"'^LVM-<view address>,<offset>'"` Variables: • view address = the address of the view definition • offset = + / - numeric display shift Example: `SEND_COMMAND Device,"'^LVM-2,-4'"` Shifts the display -4 and displays the list according to the view definitions located at address 2.
^LVO Display a data list according to a preset sort/ordering view definition.	Display a data list according to a preset sort/ordering view definition. This command tells the view which of the possible orderings to use. Note that the <sort> field is a bitmask, so that the 3 bit positions may be combined. Syntax: `SEND_COMMAND <DEV>,"'^LVO-<view address>,<sort>'"` Variables: • view address = the address of the view definition • sort = bitmask with the following bit assignments: 0x0001 = Sort 0x0002 = Reverse 0x0004 = Filter **Note:** Of special note is the reverse bit (0x0002), which reverses the list whatever order it is currently in. When used on a sorted list, it results in a reverse sort. When used on a reverse sorted list, it results in a forward sorted list. In most cases, the reverse bit should not be used alone, but should be used in combination with the sort bit (0x0003) such that it always results in a reverse sorted list. Possible values for the sort field: 0 = None 1 = Forward Sort 2 = Reverse the current list ordering (may or may not be sorted) 3 = Reverse Sort 4 = Filter 5 = Forward Sort + Filter 6 = Reverse current + filter 7 = Reverse sort + filter Example: `SEND_COMMAND Device,"'^LVO-1,7'"` Displays the data list according to the view definitions located at address 1 and filters and reverse sorts the list.

List Box Commands (Cont.)	
List View Commands	
^LVP Display a new position	Display a new position. If the select option is set, then select that position. Syntax: `SEND_COMMAND <DEV>,"'^LVP-<view address>,<index>'"` Variables: • view address = the address of the view definition • index = the row number in sequential order (first row is 1) Example: `SEND_COMMAND Device,"'^LVP-5,3'"` Sets the display position starting at the third row and displays it according to the view definitions located at address 5.
^LVS Set the column order for sorting	Set the column order for sorting. Update must be called for changes to take effect. Syntax: `SEND_COMMAND <DEV>,"'^LVS-<view address>,<column>,<column>…'"` Variables: • view address = the address of the view definition • column = the starting column number (first column is 1) Example: `SEND_COMMAND Device,"'^LVS-3,5,2,1'"` Sets the column sort order to column 5 first, then column 2 and then column 1. The data list is displayed according to the view definitions located at address 3.
^LVU Update any view currently looking at this list	Update any view currently looking at this list. **NOTE:** This must be called after changes to list data. Syntax: `SEND_COMMAND <DEV>,"'^LVU-<view address>'"` Variables: • view address = the address of the view definition Example: `SEND_COMMAND Device,"'LVU-3'"` Updates the data list and displays it according to the view definitions located at address 3.

Troubleshooting

This section describes the solutions to possible hardware/firmware issues that could arise during the common operation of a TPI-PRO.

Troubleshooting Information	
Symptom	Solution
Manifest.xma can not be found. An error occurs when sending a file to a G4 panel.	Manifest.xma is the file that contains the listing for all the files. If you see this error again, before attempting to send the file, uncheck the Smart Transfer box. It may be necessary do a Full Clean.
The video pages appear blank upon TPI-PRO restart.	Wrong input type may be selected. Go to Video Settings page and select the appropriate input type for that input.
When using G4 WebControl to communicate with a target TPI-Pro, a VNC Server dialog appears on my screen.	• During a WebControl connection to a target TPI-PRO you are prompted with a G4 Authentication dialog which asks you to enter the assigned password for the TPI-PRO (before gaining access). • If you are ever prompted with a VNC Server dialog, you must enter the IP Address of the target panel. This can be found within the **Setup** > **Protected Setup** > **System Connection** page. - This IP Address of the TPI-PRO appears within the IP Settings section of this page. • Enter the IP Address and click **OK**. You will then be prompted with the G4 Authentication popup where you must enter the TPI-PRO's WebControl password.
The image on my video page isn't centered and/or aligned properly even though I'm using the RGB/Video Setup page alignment tools.	• Before an image can be displayed onto a touch panel or other CRT monitor it must first be positioned to occupy the available visible space on the panel/monitor. • After completing those tasks, use the monitor's video controls to stretch and move the incoming video so that the borders of the desired resolution pattern follow the edges of the screen without disappearing. There are normally 60 seconds before the resolution times-out, but you can press the front panel RESOLUTION button again several time to return to the previous resolution pattern and continue setting-up the monitor. • Once these baseline alignments are done, use the RGB controls to complete the final positioning of the incoming image/video.
I can't seem to connect to a NetLinx Master using my NetLinx Studio 2.4.	• From the **Settings** > **Master Comm Settings** > **Communication Settings** > **Settings (for TCP/IP)**, uncheck the "**Automatically Ping the Master Controller** to ensure availability" check box. • The pinging is to determine if the Master is available, and to reply with a connection failure instantly if it is not. Without using the ping feature, you will still attempt to make a connection, but a failure will take longer to be recognized. Some firewalls and networks do not allow pinging, though, and the ping will then always result in a failure. • When connecting to a NetLinx Master controller via TCP/IP, the program will first try to ping the controller before attempting a connection. Pinging a device is relatively fast and will determine if the device is off-line, or if the TCP/IP address that was entered was incorrect. If you decide NOT to ping for availability and the controller is off-line, or you have an incorrect TCP/IP address, the program will try for 30-45 seconds to establish a connection. ***Note**:* If you are trying to connect to a Master controller that is behind a firewall, you may have to uncheck this option. Most firewalls will not allow ping requests to pass through for security reasons.

Troubleshooting Information (Cont.)	
Symptom	Solution
After downloading a panel file or firmware to a G4 device, the device behaves strangely.	Symptoms include: • Having to repeat the download. • Inability to make further downloads to the panel. May get "directory" errors, "graphics hierarchy" errors, etc. indicating problems with the Compact Flash. • Panel will not boot, or gets stuck on "AMX" splash screen. • Other problems also started after downloading to a new panel or a panel with a TPD4 file that takes up a considerable amount of the available Compact Flash. Cause: • If the G4 device already contains a large enough file, subsequent downloads will take up more space than is available and could often corrupt the disk. The demo file that typically ships with G4 panels is one such file. Solution: • DO NOT download TPD4 files (of large size) over the demo pages, or any other large TPD4 file. • First download a small blank one page file to the G4 panel using the Normal Transfer option to send/download the page. Reboot the device, then do your regular file or firmware download.
After copying and pasting images from the TPI-PRO's setup pages, the images appear over-sized on my pages.	The images on the TPI-PRO setup pages are over-sized to support the maximum resolution possible and are scaled down by the firmware when the setup pages are displayed on the device. However, the images are not scaled down when displayed as part of a user's pages. At the moment, neither G4 firmware nor TPDesign4 supports scaling images to fit the button except in the case of dynamic images. Panels that support dynamic setup pages will not be able to use images from the TPI-PRO's setup pages. For now, you should refrain from using images from the TPI-PRO's setup pages, and instead use the images from the setup pages for one of the other panel types that supports the resolution for which you are designing user pages.

Appendix

Text Formatting Codes for Bargraphs/Joysticks

Text formatting codes for bargraphs provide a mechanism to allow a portion of a bargraphs text to be dynamically provided information about the current status of the level (multistate and traditional). These codes would be entered into the text field along with any other text.

The following is a code list used for bargraphs:

Bargraph Text Code Inputs		
Code	Bargraph	Multi-State Bargraph
$P	Display the current percentage of the bargraph (derived from the Adjusted Level Value as it falls between the Range Values)	Display the current percentage of the bargraph (derived from the Adjusted Level Value as it falls between the Range Values)
$V	Raw Level Value	Raw Level Value
$L	Range Low Value	Range Low Value
$H	Range High Value	Range High Value
$S	N/A	Current State
$A	Adjusted Level Value (Range Low Value subtracted from the Raw Level Value)	Adjusted Level Value (Range Low Value subtracted from the Raw Level Value)
$R	Low Range subtracted from the High Range	Low Range subtracted from the High Range
$$	Dollar sign	Dollar sign

Buy changing the text on a button (via a VT command) you can modify the codes on a button. When one of the Text Formatting Codes is encountered by the firmware it is replaced with the correct value. These values are derived from the following operations:

Formatting Code Operations	
Code	Operation
$P	(Current Value - Range Low Value / Range High Value - Range Low Value) x 100
$V	Current Level Value
$L	Range Low Value
$H	Range High Value
$S	Current State (if regular bargraph then resolves to nothing)
$A	Current Value - Range Low Value
$R	Range High Value - Range Low Value

Given a current raw level value of 532, a range low value of 500 and a high range value of 600 the following text formatting codes would yield the following strings as shown in the table below:

Example	
Format	Display
$P%	32%
$A out of $R	32 out of 100
$A of 0 - $R	32 of 0 - 100
$V of $L - $H	532 of 500 - 600

Text Area Input Masking

Text Area Input Masking can be used to limit the allowed/correct characters that are entered into a text area. For example, in working with a zip code, a user could limit the entry to a max length of only 5 characters but, with input masking, you could limit them to 5 mandatory numerical digits and 4 optional numerical digits. A possible use for this feature is to enter information into form fields. The purpose of this feature is to:

- Force you to use correct type of characters (i.e. numbers vs. characters)
- Limit the number of characters in a text area
- Suggest proper format with fixed characters
- Right to Left
- Required or Optional
- Change/Force a Case
- Create multiple logical fields
- Specify range of characters/number for each field

With this feature, it is NOT necessary to:

- Limit you to a choice of selections
- Handle complex input tasks such as names, days of the week, or months by name
- Perform complex validation such as Subnet Mask validation

Input Mask Character Types

These character types define what information is allowed to be entered in any specific instance. The following table lists what characters in an input mask will define what characters are allowed in any given position.

Character Types	
Character	Masking Rule
0	Digit (0 to 9, entry required, plus [+] and minus [-] signs not allowed)
9	Digit or space (entry not required, plus and minus signs not allowed)
#	Digit or space (entry not required; plus and minus signs allowed)
L	Letter (A to Z, entry required)
?	Letter (A to Z, entry optional)
A	Letter or digit (entry required)
a	Letter or digit (entry optional)
&	Any character or a space (entry required)
C	Any character or a space (entry optional)



The number of the above characters used determines the length of the input masking box. Example: 0000 requires an entry, requires digits to be used, and allows only 4 characters to be entered/used.

Refer to the following Send Commands for more detailed information:

- ^BIM - Sets the input mask for the specified addresses. (see the *^BIM* section on page 90).
- ^BMF subcommand **%MK** - sets the input mask of a text area (see the *^BMF* section on page 92).

Input Mask Ranges

These ranges allow a user to specify the minimum and maximum numeric value for a field. ***Only one range is allowed per field. Using a range implies a numeric entry ONLY.***

Input Mask Ranges	
Character	Meaning
[	Start range
]	End range
\|	Range Separator

An example from the above table:

[0|255] This allows a user to enter a value from 0 to 255.

Input Mask Next Field Characters

These characters allow you to specify a list of characters that cause the keyboard to move the focus to the next field when pressed instead of inserting the text into the text area.

Input Mask Next Field Char	
Character	Meaning
{	Start Next Field List
}	End Next Field List

An example from the above table:

{.} or {:} or {.:} Tells the system that after a user hits any of these keys, proceed to the next text area input box.

Input Mask Operations

Input Mask Operators change the behavior of the filed in the following way:

Input Mask Operators	
Character	Meaning
<	Forces all characters to be converted to lowercase
>	Forces all characters to be converted to uppercase
^	Sets the overflow flag for this field

Input Mask Literals

To define a literal character, enter any character, other than those shown in the above table *(including spaces, and symbols)*. A back-slash ('\') causes the character that follows it to be displayed as the literal character. For example, **\A** is displayed just as the letter **A**. To define one of the following characters as a literal character, precede that character with a back-slash. Text entry operation using Input Masks.

A keyboard entry using normal text entry is straightforward. However, once an input mask is applied, the behavior of the keyboard needs to change to accommodate the input mask's requirement. When working with masks, any literal characters in the mask will be "skipped" by any cursor movement including cursor keys, backspace, and delete.

When operating with a mask, the mask should be displayed with placeholders. The "-" character should display where you should enter a character. The arrow keys will move between the "-" characters and allow you to replace them. The text entry code operates as if it is in the overwrite mode. If the cursor is positioned on a character already entered and you type in a new (and valid) character, the new character replace the old character. There is no shifting of characters.

When working with ranges specified by the [] mask, the keyboard allows you to enter a number between the values listed in the ranges. If a user enters a value that is larger than the max, the maximum number of right-most characters is used to create a new, acceptable value.

- **Example 1**: If you type "125" into a field accepting 0-100, then the values displayed will be "1", "12", "25".
- **Example 2**: If the max for the filed was 20, then the values displayed will be "1", "12", "5".

When data overflows from a numerical field, the overflow value is added to the previous field on the chain, if the overflow character was specified. In the above example, if the overflow flag was set, the first example will place the "1" into the previous logical field and the second example will place "12" in the previous logical field. If the overflow filed already contains a value, the new value will be inserted to the right of the current characters and the overflow field will be evaluated. Overflow continues to work until a filed with no overflow value is set or there are no more fields left (i.e. reached first field).

If a character is typed and that characters appear in the Next Field list, the keyboard should move the focus to the next field. For example, when entering time, a **":"** is used as a next field character. If you hit "1:2", the 1 is entered in the current field (hours) and then the focus is moved to the next field and 2 is entered in that field.

When entering time in a 12-hour format, entry of AM and PM is required. Instead of adding AM/PM to the input mask specification, the AM/PM should be handled within the NetLinx code. This allows a programmer to show/hide and provide discrete feedback for AM and PM.

Input Mask Output Examples

The following are some common input masking examples:

Output Examples		
Common Name	Input Mask	Input
IP Address Quad	[0\|255]{.}	Any value from 0 to 255
Hour	[1\|12]{:}	Any value from 1 to 12
Minute/Second	[0\|59]{:}	Any value from 0 to 59
Frames	[0\|29]{:}	Any value from 0 to 29
Phone Numbers	(999) 000-0000	(555) 555-5555
Zip Code	00000-9999	75082-4567

URL Resources

A URL can be broken into several parts. For example: the URL *http://www.amx.com/company-info-home.asp*. This URL indicates that the protocol in use is **http** (HyperText Transport Protocol) and that the information resides on a host machine named **www.amx.com**. The image on that host machine is given an assignment (*by the program*) name of **company-info-home.asp** *(Active Server Page)*.

The exact meaning of this name on the host machine is both protocol dependent and host dependent. The information normally resides in a file, but it could be generated dynamically. This component of the URL is called the file component, even though the information is not necessarily in a file.

A URL can optionally specify a port, which is the port number to which the TCP connection is made on the remote host machine. If the port is not specified, the default port for the protocol is used instead. For example, the default port for http is 80. An alternative port could be specified as: http://www.amx.com:8080/company-info-home.asp.



Any legal HTTP syntax can be used.

Special Escape Sequences

The system has only a limited knowledge of URL formats in that it transparently passes the URL information onto the server for translation. A user can then pass any parameters to the server side programs such as CGI scripts or active server pages. However, the system will parse the URL looking for special escape codes. When it finds an escape code it replaces that code with a particular piece of panel, button, or state information. For example, "http://www.amx.com/img.asp?device=$DV" would become "http://www.amx.com/img.asp?device=10001". Other used escape sequences include:

Escape Sequences	
Sequence	Panel Information
$DV	Device Number
$SY	System Number
$IP	IP Address
$HN	Host Name
$MC	Mac Address
$ID	Neuron ID
$PX	X Resolution of current panel mode/file
$PY	Y Resolution of current panel mode/file
$BX	X Resolution of current button
$BY	Y Resolution of current button
$BN	Name of button
$ST	Current state
$AC	Address Code
$AP	Address Port
$CC	Channel Code
$CP	Channel Port
$LC	Level Code
$LP	Level Port

List of Available Pixel Display and Refresh Rates

The following list describes the available pixel display and refresh rates.

- 640 x 480@60Hz
- 640 x 480@72Hz
- 640 x 480@75Hz
- 800 x 600@60Hz
- 800 x 600@72Hz
- 800 x 600@75Hz
- 1024 x 768@60Hz
- 1024 x 768@70Hz
- 1024 x 768@75Hz
- 1280 x 720@60Hz
- 1280 x 1024@60Hz (**default**)
- 1360 x 768@60Hz
- 1600 x 1200@60Hz
- 1680 x 1050@60Hz
- 1920 x 1080@60Hz (rb)
- 1920 x 1200@60Hz (**highest setting**)

List of Touch Monitors and USB Touch Drivers Tested with the TPI-PRO

Refer to **www.amx.com** for list of latest supported serial touch monitors and USB touch monitors.

NOTE

The TPI-PRO KIT firmware file must be downloaded before downloading the latest TPI-PRO Drivers file (v2.3.14). The latest release of the Drivers file is incompatible with previous versions (2.2.7 and before) of the TPI-PRO firmware.
Touch driver kit file v2.3.14 can be downloaded only to TPI-PRO board with main firmware v2.3.14 or higher version.

TakeNote™

You can demonstrate truly interactive presentations using AMX's TakeNote annotation application, NXA-USBTN (FG070-603). TakeNote enables you to use your finger or a stylus to draw directly on the Modero screen. The resulting annotations are displayed both on Modero and the PC. TakeNote even supports multiple users for the ultimate collaborative environment. TakeNote is included with your TPI-PRO on a USB stick (FIG. 54).



FIG. 54 NXA-USBTN - TakeNote USB Computer Control Stick

This 64MB USB Control Stick contains everything you need to implement both Computer Control and TakeNote functionality including:

- The amxCC server application
- The configCC configuration utility
- NetLinx cc-GuestPC Code Module
- Sample Code and Programming/Configuration Pages
- AMX TakeNote on-screen annotation application

To annotate over video using the TakeNote application, you must install a video card into a PC which is connected to the TPI-PRO. For more information on configuring and using TakeNote, consult the TakeNote Quick Start Guide included with the TakeNote USB Control Stick.



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